Surveys of Foreign Scientific and Technical Literature

DRUG RESISTANT DISEASES

ATD Work Assignment no. A-68-42

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Appendix - MEDLARS Bibliography 1964 to date

BEST AVAILABLE COPY
Introduction

This collection of abstracts provides information on Malaria, Japanese B Encephalitis and Melioidosis in the Soviet Union, China and Vietnam obtained from publications dated 1 January 1964 to date.

Our searches concentrated on resistance to therapy, drug resistant forms, incidence, clinical treatment and chemotherapeutics of the diseases. Although primary stress in the malaria search was on Falciparum malaria, there was so little material obtained that it was thought necessary to include items of peripheral interest for their potential value.

A MEDLARS search for references on melioidosis yielded no Soviet-bloc material. As a safeguard, a further search with no restrictions on area or language turned up the brief bibliography given in the appendix. In the other bibliographies items in Russian or Chinese or those of potential primary interest are indicated by a check (✓).

Appended are bibliographies obtained by a MEDLARS search in response to an ATD request.
I. MALARIA
AUTHOR: CHANG Chi-ming (1728/4949/8900)
Huang Ch'oun-jung (7806/2504/2837)
WANG Tu-ming (3760/1705/2494)
CHANG Po-ch'i (1728/0130/0798)
TING Hsien (0002/2009)
HSI Wei-nien (1153/0251/1828)

ORG: Yen-ch'eng Special District Public Health and Epidemic Prevention Station, Kiangsu Province

TITLE: "Observation of the Effect of Pyrimethaminum and Sulfadiazinum on Tertian Malaria"

SOURCE: Peking, Chung-hua Nei-k'o Tsa-chih (Chinese Journal of Internal Medicine), Vol 12, No 5, May 64, pp 425-426

ABSTRACT: Pyrimethaminum is the most popular antimalaria drug in China in recent years. In 1959, Hurly reported that Sulfadiazinum has an obvious effect of improving the action of this drug; therefore, the authors conduct a study with the method of combining the two drugs. The area of experimentation was a simple tertian malaria region, and the 171 cases were all verified by blood examinations. The patients were divided into 6 groups.

AUTHOR: CHOU Hsueh-chang (0719/1331/4545)
CHANG Tsu-sheng (1728/4371/5110)

ORG: Chia-hsing Center for the Prevention and Treatment of Schistosomiasis

TITLE: "Clinical Analysis of 56 Cases of Severe Attacks of Malaria, and A Study of Its Treatment"

SOURCE: Peking, Chung-hua Nei-k'o Tsa-chih (Chinese Journal of Internal Medicine), Vol 12, No 5, May 64, pp 418-422

ABSTRACT: Attacks of subtertian malaria or malignant malaria are critical clinical expressions caused by the malaria protozoa. The attacks may be induced by a cold, over fatigue, over eating, or other diseases. The symptoms are not typical and may last one to three days until the patient falls into a coma. If malaria is not positively identified
in the blood, the symptoms may lead to a diagnosis of upper respiratory infection, septicemia, typhus, or acute schistosomiasis, and the treatment will be unduly delayed. This paper reviews the various different symptoms observed by the authors in the 56 cases hospitalized from July, 1962, to October, 1963.

AUTHOR: CHU Chen-tung (2612/7201/2839)
ORG: Kuei-yang Municipal First People's Hospital
TITLE: "Clinical Symptoms in 31 Cases of Malignant Malaria"
SOURCE: Peking, Chung-hua Nei-k'o- Tsa-chih (Chinese Journal of Internal Medicine), Vol 12, No. 5, May 64, pp 415-417

ABSTRACT: The clinical expressions of malignant malaria are rather complicated. The toxic symptoms are extremely severe, and these symptoms may occur at any time. From 1951 to 1961, a total of 115 cases were verified to be malignant malaria in Kuei-yang First People's Hospital through blood or bone marrow tests. The toxic symptoms of these cases were analyzed in the paper.

AUTHOR: FANG, Jui-ying (2455/3843/5391); Pien, Ju-Iien (0593/1172/3425); Yang, Pao-chu (2799/1405/3796)
ORG: Pharmacology Teaching and Research Section, Chekiang Medical University, Hangchow (Che-chiang i k' o ta hsueh Yao li hsueh chiao yen tsu, Hang-chou)
TITLE: Screening test of anti-Japanese B encephalitis virus drugs
SOURCE: Yao hsueh hsueh pao (Acta pharmaceutica sinica), v. 11, no. 6, 1964, 375-381

TOPIC TAGS: encephalitis, chemotherapy, drug effect, virus
ABSTRACT: Out of forty-seven kinds of drugs experimentally tested in mice infected with Japanese B encephalitis virus, nine were shown to possess certain therapeutic effects; they are phenelzine, funacillin, 8-aza-guanine, thiosemicarbazide, propadrine, deoxyphe- drine, phenylhydrazine, isonicotinylhydrazide, 8-MP. Of particular interest was the observation that phenelzine and funacillin inhibited the multiplication of Japanese B encephalitis virus in mouse brain. By analyzing the relationship between chemical structures and therapeutic actions of such effective substances as hydrazine benzyl compounds, cyclo semicarbazide, ephedrine analogues, anti-purine compounds, it is reasonably expected that those compounds may be used as tools for further studies to throw additional light on the chemotherapeutic mechanism of action against Japanese B encephalitis virus. The authors express thanks to Prof. CHU Heng-pi (2612/1854/3880) for reading the manuscript. Orig. art. has: 4 tables. [FDD]

AUTHOR: HO Ch'i (0149/3823)

ORG: Institute of Parasitology, Chinese Academy of Medical Sciences

TITLE: "Chinese Studies on Malaria"

SOURCE: Peking, Chung-hua Nei-k'o- Tsa-chih (Chinese Journal of Internal Medicine), Vol 12, No 5, May 64, pp 466-468

ABSTRACT: This paper reviews the accomplishments in malaria studies in China since the inclusion of the elimination of the five parasites of China in an Outline for National Development of Agriculture (draft) by the party and the central government in 1956. The major achievements discussed in the paper include: 1. The study concerning the division of malaria regions and the respective control policy of each region; 2. The study on permanent cure for tertian malaria; 3. The study on mediums and carriers of malaria.
TITLE: "Cure of Tertiary Malaria in Children with 210 mg, 180 mg, and 120 mg of Primaquine During Latency"

SOURCE: Peking, Chung-hua Nei-k'o- Tsa-chih (Chinese Journal of Internal Medicine), Vol 12, No. 5, May 64, pp 407-410

ABSTRACT: Tertiary malaria has a wide distribution, and its elimination is an important problem. In foreign countries, the method of small doses and long duration of treatment is generally used for tertiary malaria. This method is not very effective for the tertiary malaria of the Southwest Pacific area, however, the rate of recurrence is as high as 30%. From October, 1961, to May, 1962, during a period of latency, a study was conducted with 210 mg of primaquine (divided into 7 days), 180 mg (divided into 80 days), and 120 mg (divided into 4 days). Other methods were used as control. The result showed that this method is the most satisfactory for tertiary malaria in children.
ORG: Hsieh, Wang, Hu, Tai of Teaching and Research Group of Contagious Diseases, Shanghai First College of Medicine; Ti, Teaching and Research Group of Psychiatry, Shanghai First College of Medicine

TITLE: Certain Special Clinical Expressions of Tertiary Malaria

SOURCE: Peking, Chung-hua Nei-k'o Tsa-chih (Chinese Journal of Internal Medicine), Vol 12, No 5, May 64, pp 411-414

ABSTRACT: Certain special clinical expressions such as coma, jaundice, and abdominal pain are frequently reported in malignant malaria, but seldom mentioned in tertiary malaria. Of the clinical data for tertiary malaria in the hospital of Shanghai First College of Medicine, there are some obvious symptoms of central nervous system, liver, lung, and kidney involvement. These symptoms, if not understood, may lead to mistakes in diagnosis. This paper reports these symptoms observed in 329 cases of adult tertiary malaria from January, 1958, to October, 1963.

AUTHOR: YANG, Ch'ing-chang (2799/1987/3864)
CHI Shih-yung (2621/1193/2837)
TSENG Sung-k'un (2582/2646/0981)
FU Yun-fang (0265/7301/5364)
WANG Jen-chen (3076/0088/3791)
HSU Ts'ui-fen (6079/5050/5358)

ORG: All of Shanghai Municipal Center for the Prevention and Treatment of Schistosomiasis

TITLE: A Preliminary Observation of the Effect of Cyclochin on Tertian Malaria in Shanghai

SOURCE: Peking, Chung-hua Nei-k'o Tsa-chih (Chinese Journal of Internal Medicine), Vol 12, No 5, May 64, pp 423-424
ABSTRACT: Cyclochin is the 4-chloroquinum type antimalaria drug. It is not as easily accumulated as atebrin. Cyclochin is currently one of the common drugs for malaria in the Soviet Union. Its synthesis was accomplished by Shanghai Chung-hsi Pharmaceutical Plant in 1962. For the purpose of clarifying its effects as an antimalaria drug, the authors treated 34 children with tertian malaria in latency. Follow-ups in 10 weeks after the treatment was completed revealed protozoons in 93.9% of the cases, but none of the patients developed malaria symptom during the period observed.

AUTHOR: None

ORG: None

TITLE: "Current Studies on Malaria"

SOURCE: Peking, Chung-hua Nei-k'o- Tsa-chih (Chinese Journal of Internal Medicine), Vol 12, No 5, May 64, pp 405-406

ABSTRACT: Great advancements have been made in studies on malaria in recent years. Through extensive surveys and large scale experimentation, the regional distribution of malaria is basically clarified. The species of mosquitoes, their ecological habits, and their relation to the prevalence of malaria are better understood. For the purpose of thorough elimination of malaria, the following key problems are listed in the paper as being in need of concentrated effort: 1. A permanent cure for tertiary malaria must be found. 2. The techniques of fluorescent antibody tracing and others, reported in foreign countries for determining the malaria antibody in the blood of inhabitants of an epidemic area, should be introduced and developed in this country. 3. Although chloroquinum, cyclochloroguanidum, pyrimethaminum, and primaquinum are all being mass produced in China and have become common antimalaria drugs, each has its defects and none is ideal. A more effective and safer drug remains an important problem for future study.
II. JAPANESE ENCEPHALITIS
STUDIES ON THE PLAQUE-FORMING CHARACTERISTICS OF THREE STRAINS OF JAPANESE B ENCEPHALITIS VIRUS

Ch'ien Po-ch'uan (7115/0130/2938), Hsu Chao-hsiang (6079/0340/4382), and Liu Yuan-yuan (8692/0337/0337). Wei shang wu hsueh pao (Acta microbiologica sinica), v. 10, no. 3, 1964, 333-336.

The difference between plaque-forming titer and the mouse-brain LD$_{50}$ titer, the plaque-forming rate, the rate of development of plaque, and the distribution of different plaque sizes of 3 strains (the A$_2$ strain, the chick embryo adapted A$_2$ strain and the Nakayama strain) of J. B. E. virus were studied. Concerning the rate of development in number and in size of the plaques formed by these strains during incubation, it was seen that the rate was evidently greater in A$_2$ strain than those observed in the other two. Finally, the possible reasons for the differences in plaque-forming characteristics and the relation of the plaque sizes to certain biological properties of these strains of J. B. E. virus, especially in respect to A$_2$ strain and the chick embryo adapted A$_2$ strain, were discussed.

ASSOCIATION: Chung-kuo hsueh k'o hsueh yuan Ping tu hsueh yen chiu so (Virology institute, Chinese academy of medical sciences)

INTERFERON FORMATION IN CHICK EMBRYO


Only biologically active Japanese B encephalitis virus induced interferon formation in a chick embryo fibroblast tissue culture monolayer. Interferon formed in infected chick fibroblast cells quickly passed into the surrounding
fluid medium and did not accumulate in the cells. Large doses of heat-inactivated virus did not induce interferon formation in the cells. Preliminary interferon treatment of tissue culture before infection decreased rather than increased fresh interferon production.

EXPERIMENTAL STUDIES ON ACTIVE IMMUNIZATION AGAINST JAPANESE B ENCEPHALITIS; II. THE RELATION BETWEEN THE INDEX OF PROTECTION IN MICE AND THE ROUTE OF CHALLENGE

Hsu Chao-hsiung (6079/0340/4388), Chou Ming-heien (0719/2494/0341), and Ch'en Li-te. Wei sheng wu hsueh pao (Acta microbiologica sinica), v. 10, no. 1, 1964, 9-16.

In an attempt to explore the mechanism of immunization of the activated encephalitis B vaccine, the authors compared the protective effects of immunization by brain and subcutaneous inoculation. The relationship between protective action and antibody level was also studied. It was found that mice immunized only once acquired no or only a very weak protection against virus attack through the brain, but very strong protection against subcutaneous attack. Furthermore, protection against small amounts of subcutaneous virus was observed one or two days after immunization. Mice immunized twice acquired a very high protection against subcutaneous attack, and also some protection against brain attack. The protective index was related not only to the amount of vaccine, but also to the interval of injections. In general, lower protection was obtained by injection at shorter intervals than by injection at longer intervals. Protection by immunization persisted for a short time only, even though neutralizing antibodies in the blood stream persisted longer. The relation between the index of protection and the route of infection was also discussed.

ASSOCIATION: Chung-kuo i hsueh k'o hsueh yuan Ping tu hsueh hsi (Virology department, Chinese academy of medical sciences) [CR]

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STUDIES ON THE VARIATION OF PERIPHERAL PATHOGENICITY OF JAPANESE B ENCEPHALITIS IN WHITE MICE

Huang Chen-heiang (7806/4380/4382), Wei sheng wu hsueh pao (Acta microbiologica sinica), v. 10, no. 1, 1964, i-6.

Variation in the toxicity of Japanese B encephalitis virus was studied in mice of different ages, both intracerebral and subcutaneous inoculation were used, with virus material in all cases taken from the brain. The virulence of virus subcultured intracerebrally decreases over successive generations when injected subcutaneously. Conversely, subcutaneous virulence does not decrease when transmission is by the subcutaneous route. Strains with already lowered virulence regain their virulence when once again transmitted subcutaneously. The incubation period and variation in the decrease of subcutaneous virulence in successive generations of virus transmitted via the intracerebral route were related to age, incubation periods being longer and variation smaller in young mice. It was concluded that there are three stages in virus virulence of cerebrally transmitted strains, a latent period, in which progressive decrease in virulence occurs, and a static period, during which the decrease in virulence becomes stabilized.

ASSOCIATION: Chung-kuo hsueh k'o hsueh yuan Ping tu hsueh hsi (Virology department, Chinese academy of medical sciences) [CR]

STUDIES ON INFECTIOUS RIBONUCLEIC ACID OF JAPANESE B ENCEPHALITIS VIRUS; IV. THE EFFECTS OF THE VIRUS WITH INFECTED RIBONUCLEIC ACID ON BRAIN TISSUE RIBONUCLEASE ACTIVITY IN THE MOUSE


Mice were infected with B encephalitis viruses with infective ribonucleic acid, and observations on the changes in ribonuclease activity in brain tissues were made. Ribonuclease activity in the brain tissues of in-
fected mice first increased and then decreased. Injection of virus
ribonucleic acid or a large amount of virus material resulted in a more
rapid increase in ribonuclease activity. Inoculation of small amounts
of viruses caused a slow increase. When the multiplication of viruses
in the infected mouse brain reached a certain degree, ribonuclease
activity started to decrease. As virus concentration in the brain in-
creased, ribonuclease activity continued to decrease until death, by
which time it had fallen below the normal level. If a very small amount
or sublethal dose of infective material was inoculated, some or all
animals recovered easily within a short time, and ribonuclease activity
in the brain tissues returned to normal. On the basis of the experi-
mental data, it is believed that the increase in ribonuclease activity
in infected brain tissues may be the result of preliminary resistant
action of cells against the infection. The decrease of ribonuclease
activity in the later stages was probably due to intoxication and
impairment of tissue mechanisms by the virus. The relationship between
the formation of ribonuclease in cells and the low infectivity in virus
ribonucleic acid was discussed.

ASSOCIATION: Chung-kuo i hsueh k'o hsueh yuan Ping tu hei (Virology
department, Chinese academy of medical sciences)

PRODUCTION OF AN INTERFERON-LIKE SUBSTANCE FROM CHICK EMBRYO
CELL CULTURES INFECTED WITH JAPANESE B ENCEPHALITIS VIRUS

Mao Chiang-shen (3029/3068/2773), Yang Ch'ang-shou (2635/7022/
1108), and Huang Chen-hsiao (7806/4394/4382). Wei sheng wu
hsueh pao (Acta microbiologica sinica), v. 10, no. 3, 1964,
339-343.

An interfering substance with properties similar to interferon
was demonstrated in Japanese B Encephalitis virus-infected
chick embryo cell cultures. The titer of this substance, as
estimated according to the plaque inhibition method with
WEE as a challenge virus, varied from 1:32 to 1:128. The
dynamics of its production from the infected cell cultures
was studied. The results indicated that the maximum inhibi-
tory activity was observed in the cell culture fluid at
48—72 hours after virus inoculation, which was later than
the maximum titer of virus multiplication. The maintenance
level of the inhibiting substance in the infected cell was found to be related to the amount of virus inoculated. After the maximum titer of substance had been attained, some lowering of the level was observed when large doses of the virus were inoculated, while it showed no marked decrease for a period of 5 days when small inoculum was used. A comparison of the production of this substance between high (Peking strain) and low (Nakayama strain) peripheral pathogenic strains in cell cultures showed no difference in titer.

ASSOCIATION: Chung-kuo 1 hsueh k'o hsueh yuen Ping tu haueh yen chiu so (Virology institute, Chinese academy of medical sciences)

DYNAMICS OF INTERFERON PRODUCTION IN CHICK EMBRYO CELL CULTURE INFECTED WITH INFECTIVE RNA OF JAPANESE B ENCEPHALITIS VIRUS

Mao Chiang-sen (3059/3068/2773), and Huang Che-hsiang (7806/4354/4383). Wet sheng pu hsueh pao (Acta microbiologica sinica), v. 11, no. 3, 1965, 326-329.

Infecive RNA of Japanese B encephalitis virus, Peking strain, was extracted from infective mouse brain suspension by the cold phenol method. Dynamics of interferon production and virus multiplication in chick embryo cell culture after infection with infective viral RNA were compared with those infected with complete virus. The results indicate that the interferon production in the viral RNA infected group was always lower and appeared 24 hours later than those infected with complete virus during 120 hours observation. This difference holds true even when the infective dose of viral RNA used is 1 log higher than that of complete virus. No difference in the virus multiplication curve pattern was found between the 2 groups. A possible explanation of the above phenomenon was discussed.

ASSOCIATION: Chung-kuo 1 hsueh k'o hsueh yuen Ping tu haueh yen chiu so (Virology institute, Chinese academy of medical sciences)
ENHANCEMENT OF JAPANESE B ENCEPHALITIS VIRUS TITER


Japanese B encephalitis virus when grown in D₂O-treated cells was found to have a higher titer than the control. The difference was found to be greater in the heat-labile Nakayama strain than the more heat-stable Peking strain.

ELECTRON MICROSCOPIC STUDIES ON JAPANESE B ENCEPHALITIS IN TISSUE CULTURE CELLS

P'ang Ch'i-fang (7894/0360/2455), and Chang Li-pi (1728/4409/3800). Wei sheng wu hauh pao (Acta microbiologica sinica), v. 10, no. 3, 1964, 284-301.

This paper reports electron microscopic observations concerning the development of JEV in chick embryo fibroblasts and hamster kidney cells. In the early stage of the infection, "dark cells" (cells with marked metabolic activities) appeared among the "bright cells" (cells with less metabolic activity). One of the most distinct changes of the infected cells in the moderate and advanced stages was the formation of "multiple vesicles" in all parts of the cytoplasm, accompanied by the appearance of JEV. The development of JEV could be seen in almost all parts, especially in the vacuoles and matrix substance of the cytoplasm, but not in the nucleus. JEV measured approximately 26-32μ in diameter and appeared round in shape. No intracellular crystal formation could be found in the authors' studies. The release of JEV from the cells was found to be mainly through the vacuoles, which usually contained large numbers of virus particles. The relationship between JEV and the vesicles was discussed.

ASSOCIATION: Chung-kuo i hsueh k'o hsueh yuen Ping tu hsueh yen chiu so (Virology institute, Chinese academy of medical sciences)
CONCENTRATED CAMPAIGN AGAINST JAPANESE ENCEPHALITIS IN THE PRIMORSKIY KRAY (MARITIME TERRITORY)


An intensive campaign against endemic Japanese encephalitis in the Khabarovsk region of the Primorskiy Kray involving control of mosquito vectors and protection of the people from insect bites has been in progress since 1960. The tables show results of attempts to eliminate mosquitoes by spraying their breeding places with chemicals. Spraying in early spring produced the best results. Mosquito vectors of Japanese encephalitis in this region are: C. tritaeniornynchus G., C. bitaeniornynchus G., C. pipiens L., A. togoi and A. aequosus, Jum. Methyloleumide was the most effective mosquito repellent.

Table 1. Results of treating test reservoirs with a DDT aerosol

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Larvae</th>
<th>DDT (ppm)</th>
<th>Pupae</th>
<th>DDT (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.16</td>
<td>5</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>0.1</td>
<td>2-3</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>10</td>
<td>0.8</td>
<td>2-3</td>
<td>100</td>
<td>80-90</td>
</tr>
</tbody>
</table>

Table 2. Results of treating a test reservoir with 105 DDT dust

<table>
<thead>
<tr>
<th>Percent of kill</th>
<th>Time in which 100% of kill occurred (days)</th>
<th>Time in which 50% of kill occurred (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larvae</td>
<td>Pupae</td>
<td>Larvae</td>
</tr>
<tr>
<td>20-30</td>
<td>0.5-10</td>
<td>20-30</td>
</tr>
<tr>
<td>40-50</td>
<td>0.5-10</td>
<td>20-30</td>
</tr>
<tr>
<td>60-70</td>
<td>0.5-10</td>
<td>20-30</td>
</tr>
<tr>
<td>100</td>
<td>0.5-10</td>
<td>20-30</td>
</tr>
</tbody>
</table>

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Table 3. Results of spraying biotopes with a 2% aqueous solution of DDT paste

<table>
<thead>
<tr>
<th>Time mosquitoes are in contact with preparation (in hr)</th>
<th>Effect of treatment on various mosquito stages</th>
<th>No. of drops/cm² of area in the control remote areas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10 m</td>
</tr>
<tr>
<td>2-15 Larvae killed (in %)</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>24-96 Pupae</td>
<td></td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>Killed (in %)</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Surviving (in %)</td>
<td>74</td>
</tr>
</tbody>
</table>

**TITLE:** Study of Japanese encephalitis carriers in the Primorskiy Kray (Maritime Territory)

**AUTHOR:** Shestakov, V. I.; Mikhayeva, A. I.

**SOURCE:** Meditsinskaya parasitologiya i parasitarnyye bol'zni, v. 35, no. 5, 1966, 545-550

**TOPIC TAGS:** disease vector, animal disease, mosquito, virus disease, encephalitis
among the identified species were: Culex pipiens (5% of mosquito collection), C. bitaeniorhynchus (1%), C. tritaeniorhynchus (0.5%), A. togoi (78%), A. koreicus (1%), and A. escueta (2%). The population of C. tritaeniorhynchus, the chief vector of Japanese encephalitis in meadow foci, has decreased 30-40 times in recent years due to elimination of rice fields. In the coastal area, the chief species attacking man was A. togoi, and in fishing villages, A. togoi and Culex pipiens. In the meadow areas the following species commonly attacked man: A. dorsalis, A. vexans nippon, A. escueta, Anopheles hyroanus, and sometimes Culicida suture amurenese. Effective mosquito control consisted of treating ponds with insecticides (coastal regions) and serial spraying (meadow foci). Orig. art. has: 1 table and 2 figures.

[W.A. 50]


Wintering places of adult Culex and Anopheles mosquitoes in Japanese encephalitis foci in the southern Primorskiy kray were studied in 1962—1963. Vegetable storehouses, inspection wells of water supply lines, caves, cellars, etc., with humidity levels of 80—100%, were most often chosen. Mosquitoes were found in hill sites 150 m above their breeding places. Mass flight of Culex mosquitoes to wintering sites occurred in late September—early October (mean temperature 9—16°C). Mean temperature in the wintering places rarely dropped below 0°C. In the spring Anopheles hyroanus mosquitoes left the wintering sites first, in March. Culex modestus and Culex pipiens mosquitoes became active somewhat later, when the temperature inside the wintering places reached 8—10°C. Most mosquitoes had left the sites by late May—early June. The following species of mosquitoes were found in the wintering places: Culex pipiens pipiens (up to 90% of population), C. vagans, C. modestus, C. apicalis, C. orientalis, C. bitaeniorhynchus, and Anopheles hyroanus.

UDC: 595.771 Culicidae:616,988,25-022,957(571.63)

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STUDIES ON THE RELATIONSHIP BETWEEN THE DEGREE OF INACTIVATION OF JAPANESE B ENCEPHALITIS VIRUS AND THE PRODUCTION OF INTERFERON

Wang Shu-sheng (3768/2686/611C), and Huang Chen-hsiang (7869/4394/4382). Wei sheng wu hsueh pao (Acta microbiologica sinica), v. 10, no. 3, 1964, 363-368.

This paper deals with the studies of different methods and degree of inactivation of Japanese B encephalitis virus, Peking strain, on interferon production. Studies on the ability of different degrees of heat inactivated virus to interfere with the homologous virus multiplication also showed that complete inactivation of virus did not interfere with virus multiplication nor with the production of interferon. This further confirms the fact that complete inactivation of virus caused it to lose its power to elicit interferon production.

The fact that interferon is heat stable and Japanese B encephalitis virus can be completely inactivated at 56°C for 45—50 min, together with the finding that completely inactivated material does not influence the virus multiplication nor interferon production, suggest that such a simple method as inactivation may be preferable to the acid dialysis method usually employed for this purpose.

ASSOCIATION: Chung-kuo i hsueh k'o hsueh yuan Ping tu hsueh yen chiu so (Virology institute, Chinese academy of medical sciences) [CH]

EFFECT OF HIBERNATION ON THE COURSE OF JAPANESE B ENCEPHALITIS VIRUS INFECTION IN GROUND SQUIRRELS


These experiments were carried out during winter with hibernating ground squirrels, Citellus mongolicus rusesca Thomas. Lethal doses of Japanese B encephalitis virus (Nakayama strain) were inoculated into the brain of soundly torpid squirrels and observations made during and after hibernation. None of the squirrels exhibited signs of illness and no deaths could be attributable to the virus infection.
during 50 days of hibernation. Virus was found in the brain of individual squirrels from the seventh to the 44th day, and the LD₅₀ titers (in mice per 0.03 ml intracerebrally) of the virus varied between 10⁻².₃⁷ and 10⁻¹.₃⁵. No virus was isolated from the liver or spleen. After the squirrels were brought to room temperature from the cold cabinet on the seventh to 50th day, all squirrels survived after one to three days. Japanese B encephalitis virus was isolated from the brain of these squirrels and LD₅₀ reached values of 10⁻⁷.₃⁵ to 10⁻⁸.₂⁵. No virus was isolated from the liver and spleen.

ASSOCIATION: Shan-hsi hau shu wei sheng wu hsueh chiao yen tzu (Microbiology research and teaching section, Shansi medical college)

JAPANESE B ENCEPHALITIS VACCINE PREPARED FROM MONOLAYER TISSUE CULTURE; 1. VIRUS CULTIVATION AND VACCINE PREPARATION

Huang Yung-chi (370/3530/2813), Chou Ming-chien (0718/1380/8791), Ku P'ei-wen (7867/0110/1878), Su Shih (1327/0617), Ku Wen-hsin (7488/1829/0207), Su Shang-hao (1327/1114/6278), and Li Wei-jung (2321/0303/1368). Wei sheng wu hsueh pao (Acta microbiologica sinica), v. 10, no. 1, 1964, 81-38.

In 1958, the preparation of a B encephalitis vaccine was begun using chick embryo cells as a culture medium. By 1960, a considerable amount of encephalitis vaccine had been prepared and had begun to be used as a prophylactic agent for encephalitis in man. The authors investigated virus culture and preparation of vaccine. Both chick embryo and mouse brain strain of B encephalitis virus multiplied easily on single-layer chick embryo cells and could be serially passaged for many generations. The toxicity (LD₅₀) of serially passaged viruses did not increase. The growth curve pattern of various strains of the virus was studied and found to be identical with a maximum titer (LD₅₀) ranging from 10⁻⁵.⁰ to 10⁻⁶.⁰. Parallel titrations of the virus content both in infected cells and in the corresponding maintenance fluids gave comparable LD₅₀ titers. A culture medium containing seven amino acids may be used as a substitute for No. 199 culture medium in culturing the viruses of B encephalitis. The toxicity of viruses obtained from the two culture media was almost the same, but varied at different culture intervals. In the seven amino acids culture medium, it attained its maximum concentration at 48 hours or somewhat later after inoculation. In No. 199
Cultured medium, however, it attained its maximum at about 36 hours. For preparing tissue culture vaccines, it is suggested to use mouse brain strain or chick embryo strain as the parent strain, and to maintain the culture temperature of cells and virus strains at 33-37°C. When 0.1% formalin was added to the culture media, it was activated within a short time and maintained its antigenicity.

ASSOCIATION: Wei sheng pu Sheng wu chih p'in yen chiu so (Biological products institute, Ministry of public health) Wang Yung-chi, Ku P'ei-wei, Sun Kien, Chou Ning-chen and Li Mei-jung; Ch'eng-tu sheng wu chih p'in yen chiu so (Ch'eng-tu biological products institute) Ma Wen-hsin, and Sun Sheng-hao

TWO CASES OF SUCCESS IN CHICK EMBRYO ISOLATION OF B ENCEPHALITIS VIRUS FROM BLOOD

Wang Yung-chi (3789/3938/2813), and Li Mei-jung (2821/5019/1659). Wei sheng wu hsueh pao (Acta microbiologica sinica), v. 10, no. 1, 1964, 121-123.

Encephalitis viruses from the pathological materials of B encephalitis patients were isolated using chick embryo and mice. Among twenty-one blood samples, there were two positive cases. Two virus strains thus obtained were isolated successfully from the chick embryo but not from mice. From twenty-one spinal fluid samples, there was one positive case, and there were two positive cases from three brain tissue samples. All three positive cases were successfully isolated from the chick embryo and from the mouse and six virus strains obtained. The above eight virus strains have been proved to be B encephalitis viruses by means of the neutralization test, the complement fixation test, and the blood coagulation inhibiting test.

ASSOCIATION: Wei sheng pu Sheng wu chih p'in yen chiu so (Biological products institute, Ministry of public health)
III. MELIOIDOSIS
NF LICIDIOSIS STUDIES IN VIETNAM AND JAPAN.

PATTERSON MC, DARLING CL, BILMENTHAL JB
ACUTE NF LICIDIOSIS IN A SLOTH Wombat FROM ZOO, AFRICA.
JAAPA 34:145-151, MAY 1977

AFLT LAT, CASE REPORT (4), CEPHALOTHIN THERAPEUTIC USE
*CHLORAPRAPHICICL/ THERAPEUTIC USE, COLISTIN, CULTURE MEDIA, DRUG
RESISTANCE, MICROCULTURE PHENOTYPIC TECHNIQUES, GINIFERA PIGS,
HUMAN (4), ISOCIANITIN/ THERAPEUTIC USE, LIVER PATHOLOGY, LUNG/
PATHOLOGY, MALE (4), NF LICIDIOSIS/ DIAGNOSIS, NF LICIDIOSIS/ DRUG
THERAPY, NF LICIDIOSIS/ PATHOLOGY, MILITARY MEDICINE,
PELOCHROMAS/ ISOLATION & PURIFICATION, STREPTOCOX/ THERAPEUTIC USE,
STREPTOKIN/ THERAPEUTIC USE, TETRACYCLIN THERAPEUTIC USE,
THORACIC RADIOGRAPHY, UNITED STATES (1) VIETNAM (1)

ILERI RZ
THE IN VITRO HAEMAGGLUTINATION TEST IN THE DIAGNOSIS OF NF LICIDIOSIS
IN CATS.
BRIT VET J 121:164-70, APR 1965

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J VIMLA 35:118-23, JUL 1973
*COMPLEMENT FIXATION TESTS, EPIDEMIOLOGY, EXPERIMENTAL LAP STUDY
(4), HAEMAGGLUTINATION, NF LICIDIOSIS INHIBITION TESTS.
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CMAR AR
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J CCHP PATH THER 3:139-70, CCT 1963
*GCATS, HISTOCLOGICAL TECHNIQUES, HORSE DISEASES, NF LICIDIOSIS,
PATHOLOGY, SHINE DISEASES

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A CASE OF NF LICIDIOSIS IN A MACAQUE MONKEY.
VET REC 73:172-3, 16 JUL 1966
*AGGLUTINATION TESTS, LUNG PATHOLOGY, MALAYSIA (1), NF LICIDIOSIS/
DIAGNOSIS, NF LICIDIOSIS/ VETERINARY, MCNKEY DISASES, MCNKEYS

REINASARA PAGH Y
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VET REC 63:1166, 6 JUL 1968
*ABORTION, VETERINARY MICROBIOLOGY, GCATS, NF LICIDIOSIS/
VETERINARY, PREGNANCY, PREGNANCY, ANIMAL

- 23 -
BIEFLISSEN J. H., KREGLER A. H., CHERRY W. B.
A CASE OF HUMAN MELICIDIOSIS: CLINICAL, EPIDEMIOLOGICAL AND LABORATORY FINDINGS.
AMR J TEC. 13:84-90, JAN 64
EPIOL. MEAS. ECLAIR. 11, EPIDEMIOLOGY, FLUORESCENT ANTIBODY TECHNIC, MELICIDIOSIS, MICROSCOPY, FLUORESCENCE

BIEFLISSEN J. H., KREGLER A. H., CHERRY W. B.
(CASE OF HUMAN MELICIDIOSIS, CLINICAL, EPIDEMIOLOGICAL AND LABORATORY FINDINGS)
REV. ECLAIR. 21:122-37, JAN-JUN 64
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BROCHARD K. A., STASIS FR. P., ALBANO P.
OSTEOMYELITIS DUE TO PSEUDOMONAS PSEUDOMALLEI.
JAMA 196:1660-2, 16 MAY 66
APPLT, ANTIBIOTICS, THERAPEUTIC LSE; CASE REPORT (4), HUMAN (4), MELICIDIOSIS, MELICIDIOSIS, PSEUDOMONAS INFECTIONS

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AMPOSILLIN, CEPHALOSPORINS, OCHLORAMPHENICOL, THERAPEUTIC LSE, CCLISTIN, DRUG RESISTANCE, MICROBIAL, HUMAN (4), OKANAMYCN/ THERAPEUTIC LSE, MELICIDIOSIS, DIAGNOSIS, MELICIDIOSIS, DRUG THERAPY, MELICIDIOSIS, CCPOEFENCE, NCSBICIN/ THERAPEUTIC LSE, PENICILLIN G, PENICILLIN RESISTANCE, STREPTOMYCIN, SLLSPADAZINE, THERAPEUTIC LSE, TETRACYCLINE, THERAPEUTIC LSE

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FCLANTER J.
(MELICIDIOSIS AND THE WHITMORE BACILLUS, EPIDEMIOLOGICAL AND TACNYCLIC CONTROVERSIES)
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GLILLEPHAND J, BARRETT J, MCRIEAL R
(CHARLTON RULMAY R, MELICIDCAIS, (ANATOMIC-CLINICAL CASE)) (FR)
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*METRYLCPLRERYCPLCYCINE, DIAGNOSIS, DIFFERENTIAL, TUNIC
*CLIYSS, *MELICIDCAIS, *FOFICILLIN, PRECARCTOCTY,
*INAPTELYCPLPXERYCPLCYCINE, THORACIC INJURIES, THORACIC RADIOGRAPHY,
THORACIC CALCIFICATION, PULMONARY, WCNDS, GLNS-LCT

JAMES AF, DIXON GP, JCHMCA PF
MELICIDCAIS: A CCPRELATION OF THE RADICLBRIC AND PATHLOGIC
FINDINGS.
RADICLBRIC 89:230-4, ACP 87
ADLI, CHECRAPHERESICCLI/ THERAPEUTIC USE, HMAN (4), KANAMCIN/
THERAPEUTIC USE, MAF (4), MELICIDCAIS/ BRLG THERAPY,
MELICIDCAIS/ CCCURRENCE, MELICIDCAIS/ PATHLOGY, MELICIDCAIS/
RADIOGRAPHY, NNCPXICYCIN/ THERAPEUTIC USE, THORACIC RADIOGRAPHY,
UNITED STATES (1), VIETNAM (1)

FILTEFEE PJ, PAMFCGC VM
A CASE OF MELICIDCAIS IN LAMBS IN SOUTH WESTERN AUSTRALIA.
LAB ST VET J 4:179-90, VACP 67
*ABLOYSS/ VETERINARY, AUSTRALIA (1), MELICIDCAIS/ CCCURRENCE,
*MELICIDCAIS/ VETERINARY, PARALYSS/ ETILEGIC, *PARALYSS/
VETERINARY, PSELEDENCASS/ ISLATION & PURIFICATION, *SHFP
DISEASES/ CCCURRENCE, SPIAL CCCR COMPRESSICN/ VETERINARY,
*PARALYSS/ VETERINARY

NAEGRAIY GB, LEITHEAD CS
MELICIDCAIS: A CCPREPORT.
LACRE 1:862-3, 19 APR 66
CHECRAPHERESICCLI, DIAGNOSIS, DIFFERENTIAL, IRON METABOLISM, LIVER
PLACICATION TESTS, MELICIDCAIS, *SLEFADIAZANE, TETRACYCLINE

NAEGFE HR, MITCHELL RK, FITZWATER JU
MELICIDCAIS.
MEL J ST 1:1180-3, 10 JLA 67
ABLOYSS/ MICROCICLICY, ADLIT, CCPREPORT (4), CHECRAPHERESICCLI/
THERAPEUTIC USE, DIABETES MCCITYLSS/ CCPHCATIONS, DIAGNOSIS,
DIFFERENTIAL, DRAINAGE, CRLG RESISTANCE, MICRCIBIAL, FFNMALE (4),
HMAN (4), MALE (4), MELICIDCAIS, MELICIDCAIS/ CCPHCATIONS,
*MELICIDCAIS/ CRLG THERAPY, *PSELEDENCASS/ ISLATION & PURIFICATION,
*SLEFADAMIDES/ THERAPEUTIC USE, TETRACYCLINE/ THERAPEUTIC USE

NAKERELL EK
MELICIDCAIS.
JAVE 2:11490, 7 ACP 67
DIAGNOSIS, DIFFERENTIAL, FEVSS/ DIAGNOSIS, MALARIA/ DIAGNOSIS,
*MELICIDCAIS/ DIAGNOSIS, MILITARY MEDICINE, TROPICAL MEDICINE,
UNITED STATES (1), VIETNAM (1)

- 25 -
A FATAL CASE IN A BRITISH SOLDIER.


IV. VECTORS
The food sources of bloodsucking mosquitoes were studied in the summers of 1963 and 1964 in the Zaisan region of East Kazakhstan oblast by the standard methods of analyzing the blood in mosquito stomachs and using baited traps. The following species of mosquitoes were most common in the area investigated: *Anopheles hyrcanus*, *A. maculipennis*, *Aedes caspius*, *Ae. vexans*, *Ae. flavescens*, *Culex modestus*, *C. pipiens*, and *Mansonia richiardii*. It was found that on the shore of Lake Zaisan and in the Black Irtysh delta area (including nearby populated areas), food sources for mosquitoes were cattle, horses, sheep, goats, people, and birds (chiefly migratory birds). Tests of the blood in 626 mosquito stomachs using the precipitation reaction showed that in uninhabited territory and around populated areas in the Black Irtysh delta and floodplain, mosquitoes fed more on wild birds (41%) than on cattle (17%), horses (13%), or humans (20%). In settlements, the chief source of food was cattle (50%). It is probable that the role of birds as mosquito hosts is even more important in wilderness areas. Use of traps containing muskrats or wild birds showed that the greatest number and variety of bloodsucking females were attracted to common pochards (*Aythya ferina*), gadwalls (*Anas strepera*), red-necked grebes (*Podiceps grisegena*), carrion crows (*Corvus corone*), and moor buzzards (*Circus aeruginosus*). Tables with a detailed breakdown of the number of mosquitoes of each species in different areas or traps are provided. Traps fixed in the windows and chimneys of houses contained only *Anopheles hyrcanus* mosquitoes, although *A. maculipennis* and *Ae. caspius* also are known to invade houses in this area. The existence of a natural focus of ARBO viruses (equine encephalitis group) in this area was established by the presence of antibodies and viruses in the blood of six species of wild birds and
four species of bloodsucking mosquitoes, and by the demonstration of parasitic connections between mosquitoes and a number of wild bird species, humans, and agricultural animals.

UDC: 595.771-153+616.988.25-022.39(574.42)

ORG: Division of Insect Biology and Ecology, Entomological Department, Institute of Medical Parasitology and Tropical Medicine in, Ye. I. Martsinovsky, Ministry of Public Health SSSR, Moscow (Otdeleniya biologii i ekologii nasekomykh entomologicheskogo otdela Instituta meditsinskoy parazitologii i tropicheskoy meditsiny Ministerstva zdravoookhraneniya SSSR); Department of Virology, Kazakh Institute of Epidemiology, Microbiology, and Hygiene, Alma-Ata (Otdel virusologii Kazakhskogo instituta epidemiologii, mikrobiologii i gieiyenny)

MOSQUITO CONTROL IN CHINA

Ho, Ch'i (0140/3823). Recent progress in study of mosquito control in China. Chung-kuo k'un ch'ung hou chih erh shih chou nien hsuch chu t'ao lun hui hui k'ang, 1960, 67-69.

The author reviews the progress of studies made on mosquito control in China since 1952, based on discussion at the Medical Insects Group. A total of 99 papers on medical insects were submitted, and only one paper, presented by Professor Li Hui-han (2621/6540/3352) of the Shantung Medical College (Shan-tung i hsuch yuan), was on mosquito control. This indicated that studies on mosquito control had not been adequate, although a nationwide insect control program was well underway. A 1960–1961 study by Li Hui-han and Sun Wen-huai (1327/2429/0208) of the Shantung Province Parasitic Disease Control Institute (Shan-tung chi sheng ch'ung ping fang chih so) showed that Culex pipiens pallens in Tsouhsien, Shantung had been controlled with DDT and benzene hexachloride. Anopheles minimus was controlled in South China, particularly on Hainan in 1963. Control of Anopheles hyra-
canna sinensis and Anopheles ludlovii began in the Ch'ing-p'u County near Shanghai under the supervision of the East China Entomology Institute (Hua-tung k'un ch'ung yen chiu so) and in Wu-hsing County, Chekiang, under the auspices of the Parasitology Institute of the Chinese Academy of Medical Sciences (Chung-kuo i hsueh k'o hsueh yuan Chi sheng ch'ung ping yen chiu so). Preliminary results were to be available at the end of 1966. Since paddy borers and Anopheles species are bred in rice fields, the author proposes that study must be made in order to develop an effective method for simultaneous control of both insects.

ORG: Medical Insects Group (I hsueh k'un ch'ung tsu) [PY]

MITES AND TICKS OF THE SUBTROPICAL ZONE IN ABKHAZ ASSR (ACARINA, TYROGLYPHOIDEA)


Twenty-five species of Acarina and Tyroglyphoidea comprising 45% of the species of the Georgian SSR and 20% of SSSR fauna were found in the subtropical zone of Abkhaz ASSR during a study conducted mainly in 1961-62. This pest population is serious to agriculture and horticulture. Species registered in Abkhaz SSR are classified as follows: family Tyroglyphidae, 10 genera and 16 species; family Saprolegniidae, 2 genera and 2 species; family Glycyphagidae, 4 genera and 7 species. They are divided into 2 groups according to their adaptation to specific habitats: the synanthropic forms include 13 species found mainly in grain and seeds, tobacco, tea, bulbs, tubers, fruits, cellars of storehouses and granaries, and in wet debris in storehouses, mills, and wine barrels. The field forms include 12 species found in natural surroundings: forest floor, plant refuse, decomposing wood, leaves, and ant hills. The synanthropic population was heaviest where optimal moisture...
conditions were maintained. Thus, several thousands of Aleuroglyphus ovatus were found per 150-200 ml of flour residues from a water-powered mill. The population density of the field form depended on moisture conditions and on food supply, hay stacks being most heavily infested.

ASSOCIATION: Akademiya nauk, Gruzinskoy SSR, Institut zoologii (Academy of Sciences, Georgian SSR, Institute of Zoology)

ZOOLOGICAL FACTORS IN THE EXISTENCE OF SEVERAL NATURAL TULAREMIA FOCI

Kucheruk, V. V., I. L. Kulik, A. A. Nikitina, P. A. Panteleyev, I. A. Rubina, and V. V. Tupikova. Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 6, 1965, 80-86.

A July 1956 outbreak of tulareemia among water rats (Arvicola terrestris L.) living along a brook in the Altai foothills (Krasnogorsk Rayon) was described. Affected animals constituted 27% of the water rat population of the section of the brook where the epizootic occurred and 12% of the total rat population of the brook. The vector was the Ixodes tick which in its larval and nymphal stages parasitized chiefly the adult animals. Water was a less common source of infection, for after removal of the sick rats, no other animals became diseased although the brook remained infected. The epizootic was confined to the summer, coinciding with the period of mass infestation of Ixodes nymphs. It was also concentrated within a small area. Epizootics in the subalpine brook foci do not spread too far because the individual brook populations have little contact with each other during the summer. All the tularemia foci of the floodplain and subalpine brook types studied shared the following characteristics: the water rat is the universal source of infection, while Ixodes ticks serve as a reservoir of the pathogen during the periods between epizootics;
the epizootics occur during periods of peak infestation by
the tick nymphs.

ASSOCIATION: Institut epidemiologii i mikrobiologii im.
N. F. Gamalei ANN SSSR (Gamaleya Institute of Epidemiology
and Microbiology ANN SSSR)

MESQUITES IN ROCKY AREAS OF THE ILLI RIVER BASIN

Isimbekov, Zh. M. IN: Akademiya nauk Kazakhskoy SSR. Izvestiya. no.3,
1966, 71-76.

Mosquitoes are the main component of the blood-sucking insect population
of the Ili river basin. Collections were made from May to September
1963 as part of a larger study of virus-carrying insects. At the time
of the study no investigation for infection of mosquitoes was carried out
because the aim of the study was ecological rather than epidemiological
since little was known about species composition and habitat of these
insects in this area. The collection area was varied, with clear vertical
zonation in ecological areas ranging from desert to forest. Fourteen
species and one subspecies were collected from heights between 2000 and
2700 m above sea level. The table shows results of collections.
Table 1. Species Composition and Relative Number of Mosquitoes in Rocky Areas of the Ili River Basin

<table>
<thead>
<tr>
<th>Species</th>
<th>Number captured</th>
<th>Female</th>
<th>Males</th>
<th>%</th>
<th>Catch data</th>
<th>Height of Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anopheles bifasciatus L.</td>
<td>1</td>
<td>0.02</td>
<td>1.00</td>
<td></td>
<td>17.VI</td>
<td>-</td>
</tr>
<tr>
<td>An. maculipennis Mg.</td>
<td>2</td>
<td>0.5</td>
<td>2.0</td>
<td></td>
<td>21.VI</td>
<td>-</td>
</tr>
<tr>
<td>Culicoida elongicornis Ludi.</td>
<td>43</td>
<td>25.0</td>
<td>3.0</td>
<td></td>
<td>25.VI</td>
<td>-</td>
</tr>
<tr>
<td>An. capillus Pal.</td>
<td>16</td>
<td>0.4</td>
<td>1.00</td>
<td></td>
<td>2.VII</td>
<td>-</td>
</tr>
<tr>
<td>An. doreila Mg.</td>
<td>2715</td>
<td>80.0</td>
<td>0.0</td>
<td></td>
<td>19.VI</td>
<td>10.9V - 10.8V</td>
</tr>
<tr>
<td>Ae. flavescens Mull.</td>
<td>80</td>
<td>10.0</td>
<td>2.0</td>
<td></td>
<td>16.V</td>
<td>2.7V - 2.8V</td>
</tr>
<tr>
<td>Ae. caustulus Dyar.</td>
<td>63</td>
<td>1.0</td>
<td>2.0</td>
<td></td>
<td>18.V</td>
<td>10.9V - 10.8V</td>
</tr>
<tr>
<td>Ae. leucophaeus Mg.</td>
<td>90</td>
<td>10.0</td>
<td>1.0</td>
<td></td>
<td>18.V</td>
<td>10.9V - 10.8V</td>
</tr>
<tr>
<td>Ae. intrudens Dyar.</td>
<td>165</td>
<td>8.0</td>
<td>1.0</td>
<td></td>
<td>17.V</td>
<td>10.9V - 10.8V</td>
</tr>
<tr>
<td>Ae. vexans vexans Mg.</td>
<td>14</td>
<td>0.4</td>
<td>0.0</td>
<td></td>
<td>4.VII</td>
<td>-</td>
</tr>
<tr>
<td>Ae. v. allipon Theob.</td>
<td>4</td>
<td>0.1</td>
<td>0.0</td>
<td></td>
<td>23.VI</td>
<td>-</td>
</tr>
<tr>
<td>Ae. clavigerus Kg.</td>
<td>81</td>
<td>2.0</td>
<td>2.0</td>
<td></td>
<td>18.VI</td>
<td>9.7V - 10.8V</td>
</tr>
<tr>
<td>Culex modestus Fie.</td>
<td>52</td>
<td>0.8</td>
<td>1.0</td>
<td></td>
<td>18.V</td>
<td>-</td>
</tr>
<tr>
<td>C. pipiens L.</td>
<td>36</td>
<td>0.05</td>
<td>1.00</td>
<td></td>
<td>24.VII</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>3348</td>
<td>216</td>
<td>100</td>
<td></td>
<td>17.VI</td>
<td>10.5V - 30.8V</td>
</tr>
</tbody>
</table>

ASSOCIATION: Institut zoologii AN KazSSR (Institute of Zoology, Academy of Sciences Kazakh SSR) [LP]

MEDICAL INSECT CULTURE


The author reviews the progress and discusses major problems in medical insect culture. Problems encountered in development of insect strains in laboratories include difficulties.
CONTROL OF BITING INSECTS


From 25 to 28 January 1966 a meeting was held in Novosibirsk at the Biological Institute of the Siberian Branch of the Soviet Academy of Sciences on control of bloodsucking insects. One hundred and fifty representatives of 69 organisations heard 42 papers. The conference emphasised the biological basis of control of these pests. A number of papers were devoted to the ecology of bloodsucking insects in various regions of the Soviet Union, and related subjects. It was noted that when cattle are massively infested with these pests, milk production declines by 11.5%, and weight gain in calves, by 34%. The results of testing new insecticides and repellents were presented. The most effective was found to be diethyltoluamide. Good results were also obtained with benzimine. The use of protective clothing was discussed, as was the application of aerosols. Areas for further investigation were pointed out, and, in
conclusion, the following recommendations were made: developing the production of possible insecticides, establishing a system of territorial stations for pest control, and further study of the newest methods of controlling these pests.

AUTHOR: Model', Kh. H.; Mishayeva, N. P.

ORG: Belorussian Scientific Research Institute of Epidemiology and Microbiology, Minsk (Beloruskiy nauchno-issledovatel'skiy institut epidemiologii i mikrobiologii)

TITLE: Studies of the fauna and ecology of bloodsucking mosquitoes in the Gomel' oblast of the Byelorussian SSR


TOPIC TAGS: animal disease, disease vector, mosquito, population study

ABSTRACT: Twenty species of mosquitoes were identified in the Svetlogorsk rayon, including 18 bloodsucking species (subfamily Culicinæ) belonging to the genera *Anopheles*, *Aedes*, *Culex*, and *Theobaldia*, and two non-bloodsucking species (subfamily Chaoborinæ) belonging to the genera *Chaoborus* and *Nechtoryx*. The most numerous and widespread species of bloodsucking mosquitoes were *Aedes communis*, *Aedes excrucians*, *Aedes punctor*, and *Aedes maculatus*. The chief breeding places for *Aedes* mosquitoes were forest and meadow bogs, sinkholes, trenches, and ditches. The seasonal population of *Aedes* mosquitoes (late April to early September) varied depending on the biotopes. The average number of mosquitoes collected in 10 minutes was highest in areas of nettle and Spiraea (meadowsweet, etc.) growths. Orig. art. has: 1 figure. [W.A. 50]
MOSQUITOES IN THE KRASNODAR REGION


Aedes rusticus was first observed in the Soviet Union in the Krasnodar region in 1956. Since then, after a cold winter, the insect appears in the early spring and is most common in lightly wooded areas.

ASSOCIATION: Krasnodarskaya krayevaya sanepidstantsiya (Krasnodar Regional Health Station)

AUTHOR: Morozov, V. A.

ORG: Krasnodar Regional Health Station (Krasnodarskaya krayevaya sanepidstantsiya)

TITL: Mosquitoes in the Krasnodar region


TOPIC TAGS: ecology, insect, mosquito

ABSTRACT:

Aedes rusticus was first observed in the Soviet Union in the Krasnodar region in 1956. Since then, after a cold winter, the insect appears in the early spring and is most common in lightly wooded areas.
**SIMULIIDAE OF THE LOWER KAN RIVER**


In this area 25 species of simuliiidae imagos and larvae were found. During the entire season, 99.2% of adults consisted of Simulium galertum, S. moritans longipalpe, Gnus jaquinum and Gnus choloedkovi. The Kan River and the Rybnaya, its largest tributary, are the main breeding places of these bloodsucking black flies. Water temperature is the most important factor determining simuliiidae species composition in streams while current speed mainly influences habitat distribution of larvae in the river. *P. alpestris, P. tridentatum, E. longipalpe, E. bifascians, and E. shuvalovii* preferred stony bottom areas with a temperature no higher than 10°C. Only one species, *E. auresum*, was collected where current speed was less than 0.5 m/sec.

**ASSOCIATION:** Otdeleniye biologii i ekologii nasekomykh instituta meditsinskoy parasitologii i tropicheskoy meditsiny im. Ye. I. Hertsinovskogo Ministerstva zdravookhraneniya SSSR, Moskva (Insect Biology and Ecology Section, Institute of Medical Parasitology and Tropical Medicine, Ministry of Health SSSR)

MOSEQUITORS IN THE VICINITY OF NORILSK


Data resulting from collections of flies made in 1963 in the vicinity of Norilsk are summarized in Table 1. As shown, the Talnakh community is dominated by *A. comonis* and in Labytnanga, *A. azurineus, A. punctator* and *A. haemodentum* predominate. As shown by Figs. 1 and 2, the mosquito population reaches a peak in July and the mosquitoes themselves are most active during the night hours.
Table 1. Species composition and numerical relation of flies in the vicinity of Talnakh and Labytnanga (according to data collected from 1960—1964)

<table>
<thead>
<tr>
<th>Species</th>
<th>Catched</th>
<th>Talnakh</th>
<th>Labytnanga</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Larvae</td>
<td>Females</td>
<td>Males</td>
</tr>
<tr>
<td>Aedes heasanius Dyar.</td>
<td>207</td>
<td>4510</td>
<td>56</td>
</tr>
<tr>
<td>A. punctor Ktz.</td>
<td>26</td>
<td>187</td>
<td>75</td>
</tr>
<tr>
<td>A. communis Bog.</td>
<td>2009</td>
<td>182</td>
<td>30</td>
</tr>
<tr>
<td>A. puladar Coq.</td>
<td>1</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>A. infrundens Dyar.</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A. diaulusus H. D. K.</td>
<td>3</td>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>A. impiger Walk.</td>
<td>3</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>A. pionice Dyar.</td>
<td>40</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>A. cinereus Hq.</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Culicetis alaskensis Ludl.</td>
<td>182</td>
<td>12</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>2436</td>
<td>5184</td>
<td>139</td>
</tr>
</tbody>
</table>

1 A. nigripes and C. bergrothi are not included in the table.

Fig. 1. Seasonal increase in numbers of mosquitoes in the Norilsk area

Fig. 2. Daily activity of mosquitoes in the Talnakh and Labytnanga areas

1 - 3-minute count; 2 - 20-minute count.
MOSQUITOES IN TOMSK OBLAST


Twenty-three species of mosquitoes were identified in the southern part of Tomsk oblast (Western Siberia) in May-September, 1962. (See Table 1). Collections were made in

Table 1. Species composition of mosquitoes in southern Tomsk oblast (1962)

<table>
<thead>
<tr>
<th>Species</th>
<th>Number caught</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arr.</td>
</tr>
<tr>
<td>1. Anopheles maculipennis Mg.</td>
<td>2</td>
</tr>
<tr>
<td>2. Culicoides salivarius Ludi.</td>
<td>-</td>
</tr>
<tr>
<td>3. C. helophorus Paua</td>
<td>-</td>
</tr>
<tr>
<td>4. Aedes capito dorsalis Mg.</td>
<td>-</td>
</tr>
<tr>
<td>5. Aedes punctor Kirby</td>
<td>70</td>
</tr>
<tr>
<td>6. Aedes communis Mg.</td>
<td>62</td>
</tr>
<tr>
<td>7. Aedes denticulis H. D. K.</td>
<td>50</td>
</tr>
<tr>
<td>8. Aedes intiuscula Dar.</td>
<td>6</td>
</tr>
<tr>
<td>9. Aedes hespressalis Dyar.</td>
<td>12</td>
</tr>
<tr>
<td>10. Aedes pullatus Coq.</td>
<td>-</td>
</tr>
<tr>
<td>11. Aedes calciphila Dyar</td>
<td>-</td>
</tr>
<tr>
<td>12. Aedes exquisites Walk.</td>
<td>11</td>
</tr>
<tr>
<td>13. Aedes cana Mg.</td>
<td>17</td>
</tr>
<tr>
<td>14. Aedes riparius D. K.</td>
<td>-</td>
</tr>
<tr>
<td>15. Aedes hyvogeneus Müll.</td>
<td>-</td>
</tr>
<tr>
<td>16. Aedes bennettii Zen.</td>
<td>122</td>
</tr>
<tr>
<td>17. Aedes eisenus Mg.</td>
<td>11</td>
</tr>
<tr>
<td>18. Aedes rossicus D. G. M.</td>
<td>-</td>
</tr>
<tr>
<td>19. Aedes vexans Mg.</td>
<td>11</td>
</tr>
<tr>
<td>20. Culex modestus Fic.</td>
<td>17</td>
</tr>
<tr>
<td>21. Culex pipiens L.</td>
<td>30</td>
</tr>
<tr>
<td>22. Mansonia richiardii Fic.</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>462</td>
</tr>
</tbody>
</table>

pine forests along the Ob' River. Maximum numbers of mosquitoes were recorded from late May to mid-July. Peak populations varied with the species, however. Aedes communis was most numerous in early June and Aedes punctor in late June. Aedes communis mosquitoes made up 45.0% of the population, and Aedes punctor 40.0%. Mosquitoes were most active in the morning and evening hours. It was established that the most favorable temperatures for mosquito activity are between 20°C and 25°C.

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MOSQUITO ECOLOGY IN THE TOMSK REGION


In 1960, 7624 female mosquitoes from the Asino district of the Tomsk region were captured and examined, and 14 species were found, dominated by Aedes punctor, Aedes communis, and Aedes sticturus. Phenology and percentage ratios of individual species, and effects of temperature and light on flight activity were studied in order to plan mosquito control in Western Siberia.

ASSOCIATION: Laboratoriy parasitollogii Biologicheskogo instituta SO AN SSSR, Novosibirsk (Parasitology Laboratory, Biological Institute, SO AN SSSR), 5.4. 34, [LP]

DIPTERA IN THE ANGARA RIVER DISTRICT


In streams of the Angara River District water temperature is the main influence on the distribution of blackfly larvae. Where the water temperature is 3-10°C Prosimulium alpestre predominate; from 11-16°C Simulium vulgare; at 21° and above, Eusimulium auratum, E. Latipes, and Hellichia baffinensis, P. alpestre, S. vulgare, and Chelonia edwardsiana are most numerous. In streams, bloodsucking species seldom occur both in the larval and imago stages and have little practical importance.

ASSOCIATION: Otdeleniye biologii i ekologii nasekomykh Entomologicheskogo otdela Instituta meditsinskoy parasitologii i tropicheskoy meditsiny im. Ye. I. Martsinov-
BLOODSUCKING DIPTERA IN THE CHERNIZOV REGION OF THE UKRAINE


Forty-nine Dipteran species falling into three families were found in the middle part of the Resna River in the Chernizov region. Species composition, breeding places, and seasonal prevalence were studied. Anopheles breeds near the shores of the Seyma and Ubed Rivers. The greatest numbers were found in the Ubed delta. In spring Sch. mattheisseni are found principally near the Desna and Seyma. Culicidae were found in greatest numbers in the middle of June in quiet waters and in cisterns. Many Aedes species inhabit peat bogs and swamps. In spring Aedes bohningi and Ac. intrudans were prevalent; in early summer, Ae. excrucians—in damper places Ae. maculatus and Ae. flavescens; in July, Ac. diantheus and Ae. cincerus; and in August, Ac. vexans. The land and climate conditions of this area are favorable to this type of insect.

ASSOCIATION: Naucho-issledovatel'skiy institut biologii Kharkovskogo gosudarstvennogo universiteta im. Gorkogo (Biological Research Institute, Kharkov State University)
A forecast of anticipated changes in the population of bloodsucking insects (biting midges, horseflies, mosquitoes, and gnats) when the Kapchagaysky reservoir is completed is discussed. This desert basin of the Ili River is densely populated with a total of 79 species of bloodsucking insects. The insect population is expected to decrease below the dam as overflow reservoirs dry up and periodic flooding ceases. The population of Aedes mosquitoes in this area will drop sharply. Above the dam, the insect population will drop sharply in the first year but recover in 3-4 years, depending on the time of year and rate of filling of the reservoir. *Culex, Anopheles,* and *Culiseta* mosquitoes and common species of horseflies and biting midges should find numerous good breeding places around the new reservoir, especially in the shallow waters at the southern end. However, the new conditions will be unfavorable for the malaria mosquitoes *Anopheles maculipennis* and *Anopheles hyrcanus,* especially in the western and northern areas of the reservoir. There is a potential hazard of leishmaniasis if future settlements are created on the relatively pest-free northwest shore of the reservoir, since this area adjoins a natural habitat of sandflies and gerbils. Appropriate measures must be taken in the first year of existence of the reservoir to keep the population of bloodsucking insects under control.

**AUTHOR:** Shumkov, M. A.

**ORG:** Department of Entomology and Zoology, Rostov-on-Don Scientific Research Institute of Medical Parasitology, Ministry of Public Health RSFSR (Otdel entomologii i zoologii Rostovskogo-na-Donu nauchno-issledovatel'skogo instituta meditsinskoy parazitologii Ministerstva zdravookhraneniya RSFSR)

**TITLE:** Methods of detecting Aedes mosquito eggs in soil
ABSTRACT: Soil samples were taken from the Northern Donets River and Lower Don (Rostov oblast) flood plains in September-October, before the autumn rains, and were examined for eggs of six *Aedes* species (*Ae. caspius*, *Ae. vexans*, *Ae. theileri*, *Ae. kaimingi*, *Ae. flavescens*, and *Ae. azorius*). During laboratory examination, air temperature was 24.5–26.5°C, and water temperature, 19–21.5°C. Multiple rehydration and drying of soil specimens showed that mass emergence from diapausa in *Aedes* mosquitoes was in February in the steppe zone. In analysis of the soil specimens, hatched larvae were counted, and species was determined for those reaching age III–IV. The number of hatched larvae of a given species served as an index of soil infestation with that species. Orig art. has: 1 figure

PROTECTION OF DOMESTIC ANIMALS AGAINST BLOOD-SUCKING INSECTS


Aqueous emulsions of insecticides are usually applied to the skin of domestic animals to protect them against blood-sucking insects (e.g., mosquitoes). To increase the effectiveness and to decrease the toxicity of the insecticides, in the proposed method, diethylmercapto-n-butylmethylphosphine thioxide is used as the insecticide.

UDC: 632.952.2

ORG: Kazan Chemical Technology Institute im. S. M. Kirov (Kazenskiy khimiko-tehnologicheskiy institut) [PS]
EFFECT OF VOLGOGRAD RESERVOIR CONDITIONS ON BREEDING OF MOSQUITOES


The effect on the mosquito population of changing hydrological conditions in the Volga floodplain of Saratov oblast due to creation of the Volgograd reservoir was studied in 1961-1964. Seasonal fluctuations in the mosquito population are determined to a large extent by the amount of water consumed by the Volgograd and Kuybyshev hydroelectric power stations. In the completely flooded lower part of the reservoir, of course, mass breeding of mosquitoes does not occur. In the Saratov-Engels area, most favorable conditions for the development of Aedes mosquitoes are created in years of moderate floods in early spring, followed by considerable variations in the water level in spring and summer (as occurred in 1961 and 1962). Under these conditions, mass flights of mosquitoes occur in late May and again in late June. In the Marx-Volsk wooded floodplain, high floods covering large areas with shallow water promote mass breeding of mosquitoes (as in 1960). In the Halakovo-Khvalynsk floodplain, also, higher floods create larger breeding areas (as in 1963). The species composition of mosquitoes in the Engels area is approximately: 63-75% Aedes vexans, 11% A. cantans, 13% A. excrucians, 14% A. caspius and A. dorothee and a few examples of A. geniculatus, A. flavescens, A. oenius, A. cataphylla, A. pulchritarsis, A. detritus, and A. leucotarsa. Mass breeding of Culex modestus in favorable conditions occurs in July and August. The population of Anopheles maculipennis around Saratov-Engels has dropped considerably since the creation of the reservoir. Control of Aedes mosquitoes in this area is best attempted when larvae are developing in late April and early May.

ORG: Saratov Regional Sanitary-Epidemiological Station (Saratovskaya oblastnaya sonepidstantsiya) [J5]
INSECTICIDE TRIALS ON PREIMAGINAL AND IMAGINAL Aedes MOSQUITOES


Laboratory tests of four organophosphorus insecticides were conducted with preimaginal Aedes mosquitoes in water from natural biotopes (swamps adjoining the Ob in Tyumen oblast) under temperature conditions simulating the natural environment. Adult mosquitoes were also tested with lindane. Experiments showed that methylnitrophen (0,0-dimethyl 0-3-methyl-4-nitrophenyl thiophosphate) and trichlorometaphos-3 (0-methyl 0-ethyl 0-2,4,5-trichlorophenyl thiophosphate) were most toxic for Aedes larvae. The minimum dose of methylnitrophen causing 100% mortality of first- and second-stage larvae was 0.001-0.002 g of commercial preparation per m², or 0.016 g/m² for larvae of stages III and IV, or 0.012 g/m² for pupae. For trichlorometaphos-3, the minimum doses were 0.0032 g/m² for first- and second-stage larvae, 0.032 g/m² for third- and fourth-stage larvae, and 4 g/m² for pupae. DDE and methylacetophos (0-dimethyl S-carbethoxy-methyl thiophosphate) were less effective against larvae. The doses for larval stages should be considered approximate, since the insecticidal activity of organophosphorus compounds in water varies with the temperature and pH of the medium, the character of bottom sediment, the vegetation, and other factors. For adult Aedes mosquitoes, the most toxic preparations were DDEP (0,0-dimethyl 0-2,2-dichloro-vinyl phosphate) with a minimum dose causing 100% mortality of 0.0007 g/m², and 1% lindane dust, with a minimum dose of approximately 0.005 g/m². Smaller doses of insecticides were effective for smaller mosquitoes. All the above doses must be verified under natural conditions.

UDC: 615.777.25-07; 614.449, 577.1

ORG: Central Scientific Research Disinfection Institute, Moscow (Tsentr'nyy nauchno-issledovatel'skiy institut dezinfektsii)
A method of mass breeding of Aedes aegypti mosquitoes using wall cabinets with special tanks for raising larvae was described. This method, which can produce 2000—3000 mosquitoes in three to six days, has been in use since 1962. Good results are obtained with infusions of guinea pig excrement and brewer's yeast in the larval tanks. The infusion is partially replenished each week, and completely every two to three months. Temperature in the cabinets is kept at 26—28°C, and humidity at 70—80%. Adult mosquitoes intended for insecticide testing are kept in breeding places with tanks containing cotton moistened with glucor. Mosquitoes destined for egg-laying are allowed in addition to feed on guinea pigs or mice for three to four hr a day. This method of mass breeding of mosquitoes requires minimal time and attention, since larvae are automatically fed into tanks, and imagos fly out of the tanks into the breeding places.

UDC: 595.771.082

ORG: Institute of Medical Parasitology and Tropical Medicine im. Ye. I. Martsinovskiy, Ministry of Public Health USSR, Moscow (Institut meditsinskoy parasitologii i tropicheskoy meditsiny Ministerstva zdravoookhraneniya SSSR)
V. RELATED ATMOSPHERIC AND ENVIRONMENTAL ASPECTS
SETTLING OF COARSELY DISPERSED AEROSOLS IN THE ATMOSPHERIC BOUNDARY LAYER


Results are presented for field experiments investigating the diffusion of coarsely dispersed aerosols ejected from linear sources into the surface boundary layer of the atmosphere and the settling of the dispersed phase on the surface of the ground. The investigations (June—July 1960 and 1961) involved flights of an AI-2 airplane (170 km/hr speed) fitted with spraying equipment, at heights of 100—600 m above a flat area measuring 10 x 20 km covered with rather homogeneous but not dense vegetation averaging 20—30 cm in height. The spray was a water-glycerin (60% technical grade) mixture. The airplane was flown along the windward side of the test field at a given height approximately perpendicular to the wind direction. A total of 200—400 check points were spaced 500 m apart in transverse rows, 500 or 1000 m apart. Two flat troughs (0.125 m²) and one glass plate (9 x 12 cm) were used to determine by fluorescence analysis the amount of settled liquid; coated glass plates were used to make a microscopic analysis of the precipitate. After the experiment, the liquid in the troughs was washed off with a specific amount of 0.1% H₂O and 0.1% OP-7 solutions in distilled water. The fluorescein concentration in the wash was measured with an EF-3 fluorometer and the dispersed phase settled in each trough was calculated. The droplets settled on the glass plates were examined in transmitted light under a microscope equipped with an eyepiece and reticle.

Curves were constructed of the total droplet density versus the distance from the source. Subsequent analysis showed that the observed systematically higher values obtained with the fluorescence analysis were due to failure to take account of the natural background effect. However, the agreement was good enough to indicate that both methods were valid.

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Meteorological conditions existing during each experiment were checked by taking gradient measurements of the mean wind speed, temperature, and humidity at two points on opposite ends of the field at heights of 0.4 and 1.6 m, and at heights of from 25 to 600 m at one of these points. Twelve experiments were selected for quantitative comparisons; they had been conducted with uniform spraying during steady and favorable (in respect to wind direction) winds and uniform temperature stratification in the surface boundary layer of the atmosphere.

The most important fact determined during the experiments was that such aerosols may settle over areas as large as hundreds of square kilometers in periods measured in tens of minutes or hours, i.e., under conditions when meteorological conditions are functions not only of height, as is usually assumed in the theory of atmospheric diffusion, but of all three spatial coordinates and time. [ER]

FILTRATION OF AEROSOLS BY LAYERS OF FIBROUS MATERIALS


The first results obtained in an experimental investigation of aerosol filtration using layers of fibers are presented as a continuation of an earlier study of the precipitation of aerosols on single isolated fibers of various diameters. The experiments were conducted with three-dimensional layers of increasing porosity. The following materials were employed in the experiments: 1) staple fibers of industrial grade nitron with an average diameter of 16 μ, 2) FPP-15 fibrous material with an average fiber diameter of 1.5 μ, and 3) fiberglass with an average diameter of 0.8—0.9 μ. Procedures for preparing the filters from each type of fiber are described. The experiments were conducted with polydisperse polystyrene and vegetable oil aerosols having...
known particle-diameter distribution. Aerosol particles first were counted with a continuous flow VDK-4 ultramicroscope to determine initial concentrations, passed through test filters at a constant flow speed, and then redetermined after filtration.

The effectiveness of precipitation \( n \) is determined from the filtration coefficient \( K \) with the following assumptions: the layers of filter material have uniform porosity, identical diameter, and play the same role in the precipitation of aerosol particles (illustrated in text). Characteristic features of the precipitation of aerosol particles in the three types of filter material are discussed in detail.

The results of these experiments showed that in making the transition from isolated single fibers to layers of the same fibers, the filtration process is complicated by the effects of various factors caused by the structural characteristics of the layers. The following conclusions were drawn: 1) Comparative experiments showed that the nature of the dependence of effectiveness of precipitation on particle sizes for fibers in a layer differed from that for isolated fibers of the same diameter at identical flow speeds. 2) The change from isolated fibers to single fibers in a layer usually decreases the selectivity of aerosol particle sizes. 3) These peculiarities associated with precipitation on fiber layers can be explained by the effect of their structure, the arrangement of fibers, and packing irregularities.

**BACTERIOLOGICAL WEAPONS**


Bacteriological weapons are discussed as part of a new series of popularized civil-defense articles, designed to supplement the 21-hr civil-defense course. Material for bacteriological weapons should meet the following require-
ments: it should grow on artificial nutrient media, remain viable and infectious for long periods under adverse conditions, resist drying, infect rapidly and in small doses, and cause severe diseases which are difficult to cure. Diseases which are rare and little studied are preferred. The microorganisms causing plague, anthrax, tularemia, brucellosis, glanders, melioidosis, scrub typhus, smallpox, ornithosis, and yellow fever are considered suitable for these purposes. American military specialists in bacteriological weapons consider aerosols the most effective means of dispersing these agents. Clouds or fog containing microorganisms can be created over several thousand square kilometers of territory. Furthermore, man can be infected by aerosols of diseases not normally spread by this route, such as scrub typhus or yellow fever. Carriers of the chosen microorganisms, such as infected ticks, can also be airdropped in special containers. [JS]
APPENDIX

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