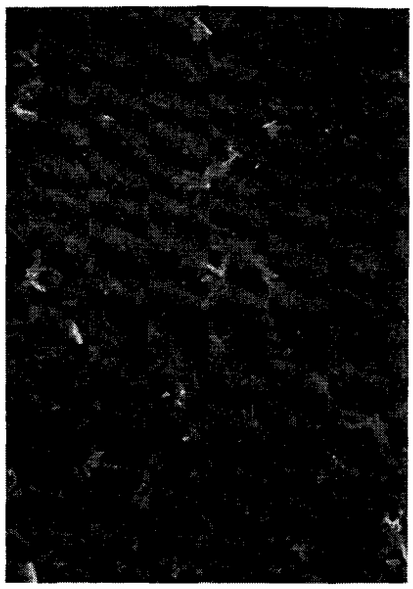

A day or two after treatment, floating larvae were observed on the surface of the lake. In some cases hundreds of larvae per square foot were concentrated on the surface of the water

By 1949, concentrations became so great that Clear Lake became known as the gnat capital of the world. Estimations of the gnat population were as fantastic as the numbers which one could observe swarming over the shore and as far inland as six miles during early evening hours—one report indicated that a million pounds of gnats left the mud at the bottom of the lake each season. In addition to invading homes and business establishments (being small enough to pass through screens), the gnats caused much other damage and annoyance and resulted in hordes of spiders that infested the area to feed on them.

After laboratory and field tests, Lake County Mosquito Abatement District used 14,000 gallons of a 30% TDE emulsion, dichlorodiphenyldichloroethane, to eradicate the pest in 1949. Results showed that this formula was 99.99% effective with little damage to the lake's high fish population. Treatment indicated complete eradication in the main lake. At that time, all larvae infestations were in water at least 10 feet deep. Many shallow outlying ponds were also infested. Many of these were difficult to treat adequately because of location or excessive weed growth, and a complete eradication was impossible within budget limitations.

During 1952 larvae were again found in Clear Lake. They were then concentrating around the edge in shallow water—apparently a separate strain that had developed in the shallow ponds and lakes. By August 1953, the infestation had developed to annoying proportions during one 2-week period. Major infestation was still concentrated in shallow water but adaptation to deep water was starting. During 1954, the infestation increased and was annoying to residents during the entire summer. A public indignation meeting sparked retreatment in spite of cost. Sept. 25 and 26 were set aside as gnat eradication days.

Gnats

The mechanical problems of distributing the insecticide over the surface of the lake so that it will be uniformly distributed in the lake water are difficult, wave action and water currents being important factors. The basic reason for the control obtained may be the habit of the larvae to migrate to the upper surface waters of the lake during the night. During daylight hours the gnat larvae are embedded in the mud of the lake bottom and laboratory experiments had indicated that it would be impossible to kill them in the mud. However, it was found that the larvae migrated upward when the water temperature of the lake was between 74 and 78° F. Thus, the control program depended for its success on a close cooperation between entomologists, weather experts, and the applicators.

Because of possible development of resistance and difficulty of contact in shallow, weedy water, dosage in 1954 was increased to 1–50,000,000 actual Rhothane D-3. Approximately 20,000 gallons of the insecticide was used. Cost was $38,000 to $40,000 for the insecticide plus $18,000 to $20,000 for labor. Early indications are that complete control has been realized and California Fish and Game authorities say that preliminary investigations show that no immediate damage to fish resulted.

Full Cooperation Required for Drafting Uniform Food Additive Law

AMSTERDAM.—Committees existing within the framework of WHO and FAO should take the lead in making legislation pertaining to food additives more uniform throughout the world. This procedure today is considered more workable than formation of a new supranational organization (such as the Schuman coal and steel community) as a regulatory body, says J. F. Reith, Pharmacy Laboratory, Utrecht. He spoke before the Third International Congress on Nutrition, held here Sept. 13 to 17.

First step towards uniformity is to collate facts behind existing legislation in the important countries of the world, declared Reith. It is necessary to make available translations of food legislation into one or two of the most generally spoken languages. To these translations mu t be added extensive background notes outlining reasons for any peculiarities. The information should be classified as to the food to which it applies and additional data should be collected on specific foods, where required.

Chemical and physical methods of analysis must be perfected and standardized. This was a point emphasized by several speakers during the sessions on chemical additives. Glaxo's A. L. Bacharach declared that solution to chemical analytical problems should precede any legislative restrictions, and pointed out that few biological methods are satisfactory for modern food production control.

Trace elements in foodstuffs present particularly difficult analytical problems. In France, the Société des Experts-Chimistes has set up a commission to study the toxic effects of trace elements and to offer advice for new legislation. Paris consultant Louis Truffert reported that the following elements had been found toxic and that tolerable limits in specific foodstuffs had been set up for them: antimony, arsenic, cadmium, fluorine, lead, selenium, and zinc; mercury is currently under investigation. General limits have been recommended for the following elements which are considered nontoxic: aluminum, chromium, copper, tin, iron, and nickel.

In addition to the chemical and physical methods required for day to day control, new toxicity tests must be devised and standardized for any questionable additives. Reith believed that setting up a new European laboratory for such testings was not practical. He preferred distribution of the work among the existing research centers.

In an earlier paper, J. N. Barnes, British Medical Research Council pointed out that toxicity tests must include studies on absorption, distribution, excretion, and metabolism. Barnes criticized the usual long-term animal feeding tests; he suggested that such tests were probably very inefficient ones for detecting abnormal responses. He made a plea for more widespread use of subacute toxicity tests with a more careful examination of any positive findings so disclosed.

As a further step in the international program, Reith went on to suggest that a positive list of tolerated additives be prepared. The aim should be to approve the smallest number of chemicals possible. Any additions to this list should be

made only after extensive testing, which would be done at the expense of the interested producer. This is the procedure now in effect in the United States applicable to the certified food colors.

General feeling in the conference was that food colors offered the best starting point for any international legislative approach. Reith pointed out a number of international inconsistencies in this field: in The Netherlands, "harmless" dyes may be added to food, but no list of such dyes is specified. In the United Kingdom the law provides only a list of prohibited dyes; in the United States and Canada a list of permitted dyes is given.

In Germany, since 1949 a special commission has been studying carcinogenic effects of synthetic dyestuffs. After rigorous testing a number of synthetic dyestuffs have now been shown to have no carcinogenic properties, said H. Druckrey, Freiburg University Clinic. On the other hand, there are numerous dyestuffs which now must be rejected as dangerous. The carcinogenic action, according to experience to date, is bound up with specific structure of various kinds. Minor changes, for example a shift in the methyl group, can cause or eliminate carcinogenic action in dyestuffs.

Druckrey predicted that within a short time chemical constitution would be definitely correlated with carcinogenic action. Already it has been determined that, for example, introduction of an acidic group into a basic azo dye practically eliminates carcinogenicity. Sulfation may also have a similar action, but breaking of the azo bridge can produce a toxic compound.

The German professor read a proposal for international restrictive legislation on food additives, that had been unanimously adopted by an international conference on the subject, held in Bad Godesberg in May of this year. An important point in this proposal was the suggestion that an international list of permitted food colors be prepared; 13 synthetic dyes were proposed, together with a number of dyes of natural origin. Specimens of the approved dyes should be exchanged on an international basis. The proposal went on to lay down a procedure for admittance of additional food additives to the approved list.

The Bad Godesberg proposal was unanimously endorsed by the Nutrition Congress, with the suggestion that the matter be referred to the International Union of Nutritional Sciences. A joint committee of the WHO and FAO studying food additives meets in November of this year and will undoubtedly consider the proposal.

German Study Reveals Lead in Yeast from Sulfite Liquor

AMSTERDAM.—Samples of torula yeast produced from spent sulfite liquor have been found to contain toxic amounts of lead, according to Karl-Heinz Wagner, Institute for Nutritional Science, Giessen, Germany. Test animals fed samples of yeast of this type showed accumulation of lead not only in the liver but also in the bone structure. Wagner made his report before the Third International Congress on Nutrition, held here Sept. 13 to 17.

At Giessen, biological evaluation of different kinds of yeast indicated that animals fed torula yeast showed slower growth rates than animals fed dry brewers' yeast. Although histological examinations gave the impression of a poisoning, the first assumption was that the difficulty was due to action of unknown protein compounds in the yeast. However, when human beings were fed samples of the yeast, changes took place in the blood chemistry analogous to changes observed in heavy metal poisoning. The degree of poisoning paralleled the quantity of yeast ingested.

On analysis, the torula yeast samples were found to contain arsenic, antimony, lead, and iron. The presence of lead in the blood of humans who had consumed the yeast samples was established by polarographic methods.

Wagner made an urgent plea for rigid control of commercially produced torula yeast. A determination of heavy metal content should be required for cattle feed as well as human food, said Wagner.

In the discussion following his lecture, Wagner's findings were sharply criticized by a representative of Zellstofffabrik Waldhof. Waldhof is probably the world's largest producer of torula yeast. Many feeding tests have been carried out over a number of years without any injurious effects, said the Waldhof spokesman. While admitting that higher contents of lead were possible in yeast samples produced shortly after the war, he indicated that important processing changes had been made since then and that recent production contained completely harmless quantities of heavy metals. He suggested that yeast for feed purposes should have a lead content not exceeding 10 to 20 p.p.m.

The torula yeast process, utilizing spent liquor from sulfite pulp mills, was perfected in Germany just prior to and during the last war. Zellstofffabrik Waldhof was the most successful of the German firms working on the process and has evolved a unique aeration technique for the fermentation. The first commercial feed yeast plant to use spent sulfite liquor in the United States started production in 1948 at Rhinelander, Wis. Since that time, several other yeast plans of similar design have gone into production.

Carbohydrates as Chemical Raw Materials?

NEW YORK.—Sooner or later, as petroleum, natural gas, and other fossil sources of basic organic chemical raw materials are consumed, the chemical industry will have to turn to replenishable raw materials, such as carbohydrates. To many the day when this will become necessary is something for treatment in science fiction by those who dream of the far distant future, but others feel that even now we should be working to find more industrial uses for carbohydrates.

Probably the foremost proponent of research on industrial applications for carbohydrates is Henry B. Hass, Sugar Research Foundation, whose interest is in sucrose and its by-products. At the symposium on sources of carbohydrate raw materials at the 126th National ACS meeting here recently, he said that what has already been done with starch should now be done with sugar. He was, of course, referring to starch's many industrial applications which consume greater volumes than food uses.

Sugar is the pure organic chemical produced in greatest quantity. Its chemical structure and the behavior of its chief functional groups are well known yet very little sugar is used as a starting point for chemical manufacturing processes, with the exception of sorbitol.

Hass said research could turn up other useful sugar derivatives, such as a synthetic detergent derived from sugar which has already been prepared on a laboratory scale. Sugar's great solubility and the fact that it is taken up by living organisms at a rapid rate suggest