

## MONTHLY REVIEW OF INTERNATIONAL BIOLOGICAL PROGRAMME



### IBP in the Soviet Union

THE SIZE AND RICH natural diversity of the Soviet Union—territorially the largest single nation on Earth—is in fact a disadvantage for Soviet scientists engaged in IBP. Professor A. Bannikov, chairman of the Soviet CT committee and spokesman for the Soviet IBP committee, made this point when I interviewed him recently in Moscow. It seems that there are not enough suitably trained scientists to cover the huge spread of territory—a hemisphere in extent east to west, and ranging from subtropical to polar north and south. Most of the population (threequarters) is concentrated in 'Old Russia', west of the Urals. One per cent is spread across the eastward third of the territory.

The national committee, meeting in Leningrad at the end of May, completed the plans for Soviet IBP participation and the details are now going out. Most of the section committees have already begun their programmes, I was told. For instance, a permanent station specially established for IBP in the tundra country of northern Siberia, near the town of Salekhard, is already in operation. It is concerned with primary and secondary productivity.

The Soviet Union has three unique contributions to make to IBP studies, considers Professor Bannikov. First, is the field of nitrogen fixation which has been under intensive study for some years as part of work directed to increasing soil productivity. Here some regional plants with a performance comparable to that of the legumes as nitrogen fixers have been identified.

Second, is work on the productivity of the sea. In his most recent research Professor Zinkevich, a Lenin prizewinner, has established that the most abundant marine life is animal and not plant as on land or as has been traditionally held true for

marine conditions. He has found that the Radiolaria (an order of marine protozoa) contribute the greatest biomass to the marine habitat.

In the third place, the Soviet Union has a unique range of national parks and a very forward-looking policy in managing them. They have been staffed by scientists and systematically studied for many years. The number of national parks in the Soviet Union today is 76 and they comprise a total area of approximately three million hectares.

Lake Baikal is currently under discussion as the site for a huge new national park, says Professor Bannikov. It is one of the great lakes of the world and probably the deepest, and possesses a number of species of fish found nowhere else. There has been much anxiety and speculation both within the country and outside since the first reports some years ago that Lake Baikal was being heavily contaminated by a cellulose plant installed on the lake shore. A leading limnologist recently declared roundly that Lake Baikal was 'finished' and would take 25 years to recover. I asked Professor Bannikov and his colleague, Professor L. K. Shapushnikov, who heads the Commission of Nature Protection (the Soviet Union's equivalent to the UK's Nature Conservancy), what was the present status of Lake Baikal. The reply was that the cellulose plant was to be completed "but all measures are being taken to avoid polluting the lake". Water is drawn from the lake into the plant, but on the output side waste water is first cleansed and then piped 60 km for release into the Irkut river. It now heads the list of Soviet lakes that are the object of special study. The institute of limnology located on its shores has a small fleet of specially equipped ships to help with the lake's systematic study. ANGELA CROOME

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#### Planning the fate of the 'wetlands'

Florida's famous Everglades, the unique water playground and nature reserve, is in danger of drying up. Drainage schemes for development just inland of the area are already reducing the freshwater that maintains it and in some years' time it could wither away completely. At the end of the six-day working meeting on Project Telma held in North Wales in June, 30 of the world's top 'wetlands' experts passed a resolution calling on US authorities to take action on the Everglades threat. The name of this joint IBP-UNESCO-IUCN project, Telma, is taken from the Greek for 'mud'.

The main purpose of the meeting was to draw up plans for

making proper use of the world's peat lands and swamps. Together these form a surprising proportion of the Earth's surface and taken as a cubic percentage of topsoil are of even more consequence. The first stage is, of course, to list them. The peat bogs of the north and the swamps of the tropics are mighty sponges controlling an as yet unmeasured reservoir of freshwater feeding the surrounding land. But in many areas the peat—the material of the sponge—is being torn up for use as fuel or humus or reclaimed as fen for agriculture. The experts are worried by the long term implications of this accelerated exploitation and want to bring it under control before it is too late. Peat, resulting from water-rotted vegetation, typically takes undisturbed centuries to form. As

a Canadian expert pointed out, if the layered structure is lost—for instance by tractors churning up the surface—there is no renewal and then of course there is no water filled sponge.

It is the uncertainty of how the peat bogs of different areas 'fix' water so that it is absorbed or released 'on demand' that constitutes the urgent scientific challenge. Studies of undisturbed control areas matched with the areas of exploitation are called for. Much of the discussion eddied between the pure conservationists, in favour simply of preserving everything 'natural' at all costs, and those who advocated but could not define the 'wise use' of peat bogs. For instance, peat lands grow the finest vegetables in North America; this is not natural but it may be wise. Of the



**BLANKET BOG** at Migneint, North Wales, shows typical peat which forms thin layer over terrain under conditions of high rainfall and relatively low temperatures in northern latitudes. Though much less thick than normal basin bog, which can be as much as 10 metres thick, blanket bog is much more widely distributed globally. Photograph by courtesy of The Nature Conservancy

Earth's peat 60 per cent lies in the Soviet Union and 100,000 people are employed in processing it for power. It is noteworthy that all the protected peat sites listed in the 1967 Soviet schedule lie west of the Urals—in Estonia, Latvia, Lithuania and Byelorussia.

For the moment Telma is concentrating on the collection of full information on the peats above latitude 40°N, defined as north of the subtropical arid zone. Later it will extend its interest worldwide—to the less numerous peat lands of the southern hemisphere and the tropical swamps.

### The Vavilov plant gene pool collection

A key collection in the proposed (UM) Plant Gene Pool project (see *SCIENCE JOURNAL*, IBP, April 1967) is the superb material accumulated by the late Soviet geneticist Nikolai Vavilov, a former President of the Soviet Academy of Agricultural Sciences, before he fell foul of the Lysenko purge. Lysenko built his reputation on the use of Vavilov material and then eliminated Vavilov in 1942. The fate of the

collection has been a matter of anxious doubt to the world's agricultural geneticists. When Academician N. Dubinin, head of the General Genetics Institute of the Academy, founded last year to replace the Lysenko 'establishment', was questioned about it he said: "Vavilov's plant gene pools collection exists at Leningrad, and work with it is being undertaken by the Institute of Plant Breeding, Leningrad, because it has such a very fine range of material."

Scientists hope that the collection is sufficiently intact to make a fruitful contribution to the world gene pool programme and that this can soon be organized.

### Proteins and oils from coconuts

Coconuts are being studied with the aim of using their protein content for human foodstuff. It is known that the kernels contain about 4.5 per cent of protein and about 40 per cent of oil. The potential supply of coconut protein is over 200,000 tonnes per year but at the present time much of this is used as animal foodstuffs

or as fertilizer and in any event is lost to the country of origin. Within the UM section Dr P. C. Spensley of the Tropical Products Institute in London, in collaboration with the Instituto Centroamericano de Investigacion y Tecnologia Industrial in Guatemala and, it is hoped, with the Ceylon Institute of Scientific and Industrial Research, will be investigating methods of extracting the oil and protein. In addition he will be exploring methods of processing the extracts into acceptable and inexpensive foods. The sugars and fibres remaining after extraction of the protein and oil will also be analysed.

### Man, plants and the Great Lakes

Although the inshore waters of the Great Lakes are now becoming badly polluted, the deeper waters offshore may remain relatively clear. Owing to differences in wave patterns, coastal waters do not mix readily with the offshore waters. This conclusion, from studies carried out mainly on Lake Michigan, was reported by Dr Clifford L. Mortimer, head of the University of Wisconsin-Milwaukee's Center for Great Lakes Studies, at the first International Symposium on Eutrophication.

Eutrophication—the increasing enrichment of lakes and streams by nutrients—is giving increasing concern to students of the Great Lakes. All lakes age slowly through natural causes, but the presence of man and his 'garbage' greatly accelerates the process. Clear waters take on a characteristic murky-green colour due to large numbers of plant plankton. A number of speakers at the symposium noted that the increase of population around the Great Lakes is leading to measurable increases in the amounts of nitrogen and phosphorus in their waters and decreases in their amounts of dissolved oxygen. Among the sources leading to increased eutrophication are nutrients in municipal sewage, industrial wastes and fertilizer drain-off from gardens and farm land. Mortimer explained that the Earth's rotation causes differences in the wave patterns between offshore and coastal waters. In Lake Michigan, for example, the coastal currents move north and south while offshore currents travel in a circular clockwise motion. The

currents tend to remain separate, with the coastal currents hugging the coastline in a band some 8 to 16 kilometres wide. The fact that the currents do not mix means that the deeper offshore waters probably remain relatively free from pollution. This finding, of course, gives no comfort to those living by the polluted lakesides.

Another paper at the symposium, by Donald F. Livermore of the University of Wisconsin, surveyed methods of removing the excess vegetation which is characteristic of many polluted waterways. Mechanical devices such as weed cutting and collecting machines have the advantage of immediate action without the risk, present in chemical treatments, of adding undesirable compounds to the water. However, the problem demands more than periodic cutting down of vegetation. "No matter how the plants are removed, other kinds of plants will probably grow, in the presence of abundant nutrients, to replace those which perish," said Livermore. He felt that we must choose which kinds of aquatic plants we want to live with, and then harvest them periodically.

### New Guinea project progress

The New Guinea human adaptability project began its career in July with a field visit by the first batch of consultant specialists from Britain and Australia. This is a joint IBP project, sponsored by the Australian Academy of Sciences and the Royal Society, to perhaps the least disturbed of primitive communities. The project will be linked to the facilities of the special Human Biology Institute promoted by the Australian Nobel prizewinner, Sir Macfarlane Burnet, which is now being built at Goroka in the Eastern Highlands.

British teams will work on nutrition, work capacity and environmental physiology; Australian specialists will handle the remainder of the HA field subjects—for instance, genetics, demography and epidemiology. A special theme of the Australian investigations is the curious disease of the central nervous system, kuru, which is known only in this area and for which there is some evidence of transmission through the consumption of human brain, an occasional practice among some tribes.