companied by other complex phenomena. Prolonged blending in a Waring blender will also produce some portions of hyphae that grow into monokaryons, but the same objections apply here as do to microsurgical operations.

In *S. commune* another method has been devised; this relies upon the fact that two monokaryons that differ only in their *B* factors will form a peculiar heterokaryon called "flat," which is easily separated into its components by isolation of single hyphal tips. The formation of "flat" mycelia takes place also in noncompatible di-mons before the formation of the new dikaryon. Thus $A^1B^2 \times (A^1B^1 + A^2B^2)$ will give rise to a region of "flat" of constitution $A^1B^2 + A^1B^1$, and hyphal tips of the latter will give rise to two types of monokaryons, A^1B^2 and A^1B^1

Ten duplicates of the noncompatible di-mon $(A^1B^1s + A^2B^2m^1 \times A^1B^2$ were made. Streak (s) is a morphological mutant linked with the *A* incompatibility factor, and m^1 is a biochemical mutant, requiring uracil, unlinked to any other known factor. In six cases, a new dikaryon was formed on the A^1B^2 side of the mating, and this was then mated with an A^2B^2 monokaryon, $[(A^1B^1s + A^2B^2m^1) \times A^1B^2] \times A^2B^2$.

In all six cases, a region of "flat" developed. These were subcultured and ten single hyphae from each were mated with the tester strains A^1B^1, A^2B^2, A^1B^2, and A^2B^1.

In three cases, only A^2B^2 types were recovered; but in the other three, some of the single hyphae cultures gave all the reactions with the testers consistent with an incompatibility type A^2B^1; they were all $s+$ and m^1 (Fig. 2).

A monokaryon of type A^2B^1 had not entered into any of the crosses, and it is felt that this constitutes good evidence that the $A^2B^1m^1$ monokaryon had been formed by an interchange of genetic material between the nuclei of the original dikaryon $(A^1B^1s + A^2B^2m^1)$. The *A* and streak factors remained in their parental combination; thus, there was no evidence for crossing over.

Although this phenomenon by which a nucleus of different incompatibility type is formed through exchange of factors between two nuclei in a vegetative hypha is not widely recognized (*8*), the evidence presented here should make it more acceptable. Unfortunately, little is known of the mechanism responsible.

Cytological studies have been made but proved unrewarding. Under phase contrast, the paired nuclei of the dikaryon in *Schizophyllum* can be seen very clearly. They consist of a large spindle-shaped outer membrane with a large dark sphere (nucleolus?) inside. During nuclear division, however, no mitotic apparatus can be seen. The dark spheres and the membrane disappear, and filamentous mitochondria concentrate in the region, but no metaphase chromosomes or spindle can be seen. Some 20 min later the daughter nuclei appear.

Work is now in progress with *Coprinus lagopus*, which appears to be a more suitable organism for such studies.

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Communications

Farmdale Drift

Recent field studies indicate that a portion of the glacial drift in northern Illinois formerly mapped as Illinoian is Farmdale in age, the earliest substage of the Wisconsin stage. The drift sheet consists of till and widespread deposits of water-laid materials in the form of kames, eskers, and kame terraces. So far as is known, this is the first reported occurrence of glacial drift of Farmdale age.

This drift is the uppermost drift in the northern half of Boone County, in all but small areas in southeastern and northwestern Winnebago County, in southeastern Stephenson County, in northern Ogle County, and in small areas in eastern Carroll and northern Whiteside counties. The loess (Peorian) cover which varies from a few inches to about 5 ft is usually leached.

Farmdale drift is recognized in auger borings and cuts to lie beneath discontinuous deposits of younger drift (Shelbyville and Bloomington?) in eastern Boone County; west, central and southern Ogle County; and eastern Whiteside County.

There are several indications that the drift is older than Iowan; the Farmdale loess [Leighton and Willman, *J. Geol.* **58**, 602 (1950)] which lies stratigraphically below Iowan drift is absent, although it occurs in the surrounding areas; the drift is more deeply weathered than Iowan drift at the same latitude in Iowa; the Farmdale drift passes beneath Shelbyville drift, which appears to be essentially contemporaneous with the Iowan of Iowa. [Shaffer, *Bull. Geol. Soc. Am.*, in press].

The Farmdale till differs markedly in color and texture from the younger tills that overlie it on the east, southeast, and south. Unaltered Farmdale till is usually light pink to salmon in color (7.5 YR 8/4 dry) and sandy textured. The color of the till resembles that of the Farmdale loess. The Farmdale till contains a higher percentage of sand and a lower percentage of clay than the Shelbyville till.

A red-brown to rusty-brown leached zone is commonly developed on both ice-laid and water-laid deposits. Texturally, this material is clay-bound pebbly sand or clay-bound sand. Red-brown to rusty-brown staining in sand may be up to 11 ft thick (the deepest seen) but the clay-bound upper portion seldom exceeds 2 or 3 ft. Calcareous till or calcareous sand and gravel is frequently found within 4½ ft of the top of the leached till. Coarse-grained granite pebbles and cobbles are common, and an occasional basic pebble or cobble is present. The pebbles, cobbles, and boulders in the clay-bound zone are usually fresh or but slightly altered.

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Streamflow and Flood-Frequency Studies

The U.S. Geological Survey, in addition to its work of routine stream gaging, is at present conducting special investigations of streamflow under two major classifications. The first is a group of projects that may be classed together as low-flow investigations. The second is a nation-wide flood-frequency study.

About 10 yr ago, Federal agencies engaged in the collection or use of hydrologic data organized the Federal Inter-Agency River Basin Committee. The committee recognized that the most pressing need in hydrologic data was for information on small drainage areas. Since that time, a greatly intensified program of small-stream gaging has been carried on by the Survey. Drainage areas ranging in size down to less than 1 mi^2 are being measured. Small streams are so numerous that procedures are being developed for sampling and for selective measuring of important parts of the range in flow.

Knowledge of the low-flow portion of the streamflow record is highly important for many purposes, including farming, water supply, sewage disposal, and control of industrial waste. During periods of drouth and of the usually recurring low-flow periods, many discharge measurements are made within the affected areas. These measurements are being correlated with the records of long-term index stations where continuous records are obtained, in order to establish relationships allowing the prediction of low-water flow in general.

Knowledge of the high-flow portion of the flow regimen of small streams is needed for design of highway culverts, storm sewers, upstream flood-control works, and other purposes. In many places, peak flood measurements on small streams are being made whenever an outstanding flood occurs. One economical means of obtaining peak-stage records is by means of crest-stage gages, which automatically record the highest stage reached at some particular point on a stream and can be converted to peak-discharge records by means of discharge measurements. Records obtained by these means will supplement data already available on larger streams and will allow the development of flood-frequency curves through a wide range in drainage area.

The rational economic design of many structures such as bridges, levees, dams, or other structures on a floodplain requires a knowledge of the size of floods that may be expected and how often, on an average, floods of some particular magnitude will occur over a long period of time.

Engineers and hydrologists have been working for a long time on the problem of defining flood magnitude and frequency relationships. Peak-flood discharges are influenced by rainfall and by many complex and interrelated physical characteristics of the drainage basins involved. It is obvious that actual records of peak discharge represent an integration of all the factors, so that direct use of discharge records should give by far the best answer to magnitude-frequency relationships.

Techniques have recently been developed by the Survey for determining generalized flood-frequency relationships over wide regions. The method consists of two major parts: (i) the determination of the averages of the highest peaks that may be expected to occur each year at any point (known as the *mean annual flood*); (ii) the determination of dimensionless frequency curves that show the relationship in magnitude of a flood of any recurrence interval to the mean annual flood.

Some flood-frequency studies have been made on a state-wide basis. Reports for some states have already been published; others are being worked on. The ultimate objective is a nation-wide coverage, so that the magnitude of a flood of any frequency may be predicted with reasonable accuracy on any stream in the United States.

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Lysenkoism in Athens

Lysenko and his doctrines of genetics need neither introduction nor explanation. The Western World's geneticists have attacked and almost completely discredited all of his claims. Now we must take from him his last withering laurel sprigs, Original Hypotheses and Bold Guessing.

Already, when the Scythians and other barbarian tribes of proto-Russia were still slumped in savagery, Aristotle, Hippocrates, and Theophrastus to the south were proffering and testing the very ideas now called Lysenko's. The time, 350 B.C.; the place, Athens. We might compare some of those ancient Greek hypotheses with the modern Russian's claims.

Lysenko insists that he can "shatter" the heredity of an organism by placing it in a radically changed environment; thus, he says, he changes wheat from