In vivo confirmation of the findings reported here would be highly significant to the clinician in the treatment of infectious diseases where penicillin fastness is encountered.

In Vitro Action of Monopyridine Iodine (I) *p*-Nitrobenzoate Against Ringworm Fungi

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In a previous report (*2*) it was demonstrated that compounds of positive univalent iodine, stabilized by coordination with pyridine, were toxic to some common pathogenic bacteria and to the saprophytic fungus, *Aspergillus niger*. The present communication deals with the action of various concentrations of the dry powder of monopyridine iodine (I) *p*-nitrobenzoate in sterile talc against the ringworm fungi, *Trichophyton gypseum* and *Microsporum audouini*. The evidence presented shows that low concentrations of the drug not only are effective against the above-mentioned fungi but also are extremely active toward the dried spores of these fungi.

EXPERIMENTS WITH *T. gypseum*

Strain #9533, obtained from the American Type Culture Collection, was used in this portion of the work.

The fungicidal activity of the *p*-nitrobenzoate against the dried spores was determined in the following manner: A saline suspension containing 24,000,000 conidia/ml. was prepared as described in a proposed A.P.H.A. method for testing fungicides against *Trichophyton* (*1*). Sterile pieces (5 mm.^{2}) of Whatman filter paper No. 40 were soaked in this suspension and dried at 37.5° C. for two to six days. Duplicate dried impregnated papers were immersed in various concentrations (3, 5, 10, 15, 20, 25, and 50 per cent) of the dry powder in sterile talc for intervals of 1, 5, and 10 minutes, after which they were washed twice in Sabouraud's liquid medium and deposited on Sabouraud's agar slants. Dry and washed controls were set up in duplicate. The slants were examined daily for two weeks. With two exceptions (10 per cent-5 minutes and 25 per cent-1 minute), no growth resulted from those papers which had been immersed in *p*-nitrobenzoate in concentrations of 10 per cent or greater. All controls grew out rapidly.

To test for fungistatic and fungicidal activity using the agar cup-plate method, the following experiments were performed: Sterile 9-cc. Petri dishes, in the center of which were sublimation rings, were filled with Sabouraud's agar. After the agar had hardened, the sublimation rings were removed and *T. gypseum* was streaked over the entire surface with a dry, sterile cotton swab. Then the cup was filled with the appropriate concentration of the drug in sterile talc. These plates were incubated at room temperature for approximately 10 days, and the zones of inhibition measured. The results are shown in Table 1. A portion of agar from the clear zone was transferred to a Sabouraud's glucose agar slant. The absence of growth on the slant after an incubation period of two weeks indicated that the compound is fungicidal toward *T. gypseum*.

TABLE 1

FUNGISTATIC ACTION ON *T. gypseum* BY MONOPYRIDINE IODINE (I) *p*-NITROBENZOATE

Per cent drug	3	5	10	15
Zone of inhibition* (in mm.) ..	12	16	19	23

* The averages of triplicate plates.

EXPERIMENTS WITH *M. audouini*

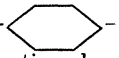
A saline suspension of conidia of a freshly isolated strain of *M. audouini* from a case of ringworm of the scalp was diluted to 18 per cent light transmittance as measured against a saline standard on a Lumetron photoelectric colorimeter, Model 400-G.[1] Sterile filter papers (5 mm.^{2}) were soaked in the suspension and dried for only 24 hours at 37.5° C., since the spores of *M. audouini* proved to be extremely sensitive to drying as compared to those of *T. gypseum*. Duplicate test papers were immersed in various concentrations (3, 5, 10, and 15 per cent) of the dry drug in sterile talc for intervals of 1, 5, and 10 minutes and treated as described previously for *T. gypseum*. At the time the slants were discarded after one month of observation, growth had occurred only in the controls and the papers treated with 3 per cent of the compound.

The agar cup-plate technique described for testing the fungistatic activity of monopyridine iodine (I) *p*-nitrobenzoate against *T. gypseum* proved less successful with *M. audouini*, since regular zones of inhibition could not be obtained because of the lack of uniform growth. However, the areas of inhibition in the case of the latter were greater than those obtained with the former for corresponding concentrations of compound.

DISCUSSION

Monopyridine iodine (I) *p*-nitrobenzoate, I (C_5H_5N),

[1] It proved impossible to make a count of the conidia in a haemocytometer.

 , is an unusual compound, the iodine acting chemically as a positive ion. Hydrolysis or reduction produces elementary iodine.

It is probable that in the agar cup-plate tests against *T. gypseum* and *M. audouini* at least part of the activity of the compound is due to the liberation of iodine, as there is evidence that the latter is produced during the period of contact with the fungi. On the other hand, in the experiments with dried spores the role of free iodine is questionable.

The impregnated papers are in contact with the compound for very short periods of time, after which the excess drug is washed off. However, the usual difficulties in procedures of this sort are encountered. It is impossible to remove all of the active compound by washing, and there is always a possibility that traces of the drug remaining may exert some activity during the washing process. The filter papers, when tested after washing, give evidence of traces of positive iodine. The washing process itself produces no free iodine, since tests for this element in the wash solutions are negative.

References

1. EMMONS, C. W. Private communication.
2. KLEINBERG, J., NOVAK, M., and GERBER, V. *Proc. Soc. exp. Biol. Med.*, 1945, **58**, 238.

Letters to the Editor

Surface Measurements of Radioactive Phosphorus in Breast Tumors as a Possible Diagnostic Method

It has been shown repeatedly by assaying tissues that most experimental tumors take up relatively greater amounts of radiophosphorus (P^{32}) than normal tissues. In 1942 Marinelli and associate showed that after tracer doses of P^{32} to three human cases the beta ray activity as measured on the surface was greater over cutaneous lesions than over normal skin.

It occurred to me that the energy of the beta rays from radioactive phosphorus was sufficiently great that, if tumors in the subcutaneous tissues took up more P^{32} than the surrounding tissues, it should be possible to detect a difference by measurements on the skin surface. Therefore, in June 1945 preliminary investigations were started in the Division of Radiology, in cooperation with the Division of Surgery of the University of California Medical School, to study the differential uptake by breast tumors of tracer doses of P^{32}. The radioactivity on the surface of the skin over various types of breast tumors, over axillary nodes, and over supraclavicular nodes was measured with a Geiger-Müller counter a day or two before surgical removal. These measurements revealed that over tumors which were proven later to be malignant the activity was 25 per cent or more above that of comparative normal areas. Skin measurements over breast tumors which were later proven to be benign consistently showed less than 25 per cent difference between involved and uninvolved tissue. In March 1946 systematic studies were undertaken by comparing the activity measured on the skin surface over palpable breast tumors, adjacent areas of the same breast, comparative areas of the other breast, and the lymphatic drainage areas. In all but one of 25 patients the diagnosis based on preoperative surface measurements was confirmed by microscopical examination of the tissues after surgery.

These findings are so suggestive that this brief report is submitted with the hope that other investigators will try the method. A more detailed but still preliminary report on this subject will appear in the November 1946 issue of *Radiology*.

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On Eugen Fischer

The note about Eugen Fischer, professor of physical anthropology, University of Berlin, and director of the Kaiser Wilhelm-Institut für Physische Anthropologie (*Science*, 1946, **104**, 161) brings to mind that he was one of the leading Nazi anthropologists who are morally responsible for the persecution and extinction of the peoples and races the Nazis considered "inferior." He was the first Nazi rector of the University of Berlin and took over this post when decent scholars withdrew or refused to do business with the Nazis. His address delivered at the inauguration ceremonies (29 July 1933) was entitled: "The Conception of the 'Völkisch' (Nazi) State in the View of Biology." This address foreshadowed the official execution of the principles of "racial hygiene" as taught by the Nazis.

If anyone, he is the man who should be put on the list of war criminals.

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Effect of 2,4-Dichlorophenoxyacetic Acid on the Development of Anjou Pear Scald

The inhibiting action of growth-regulating chemicals on the development of apple scald has been reported by Schomer and Marth (*Bot. Gaz.*, 1945, **107**, 284–290). Treatment of apples at time of cold storage with α-naphthaleneacetic acid, β-indolebutyric acid, and a mixture of these two compounds with α-naphthalene acet-