cruris, Epidermophyton inguinale, Glenospora gammeli, Microsporon audouini, Monosporum apiospermum, Trichophyton crateriforme, Trichophyton sulfureum showed growth within 8 days. On W and M *Endomyces capsulatus, Endomyces dermatitidus* and *Indiella americana* showed good growth in 8 days and on EW and EM scant growth in 18 days. On W and M *Scopulariopsis brevicaulis* showed good growth in 3 days and on EW and EM good growth in 10 days (saprophytes of the groups Actinomyces, Alternaria. Aspergillus, Fusarium, Homodendron, Mucor and Penicillium were checked and showed good growth on all media in 3 days). *Achorion schoenleinii* showed good growth on EW and EM in 3 days and scant growth on W and M in 10 days. No growth of the latter organism had been noted on children's hair.[1]

No inhibition of growth of *Microsporon audouini* was noted on any of the media as one might expect because of lack of pathogenicity of this organism for scalps of adults. Future work will be directed toward isolation of fungi from healthy scalps under the assumption that infection may be spread by scratching or allergy result from absorption or inhalation of the organismal specific substances.

7792 C

III. Effect of Dyes on Colonies of Certain Pathogenic Fungi.*

JOHN W. WILLIAMS AND LEO GREEN.

From the Department of Biology and Public Health and the Homberg Memorial Infirmary, Massachusetts Institute of Technology.

Observations were made on growth and coloring of colonies of certain pathogenic fungi cultured on a medium (4% peptone, 1% dextrose, 1½% agar, pH 5.6) containing alcoholic nigrosine, litmus, eosin Y and eosin B, respectively.[1, 2]

In the work here reported 5 batches of a similar medium containing the following percentages of dyes† respectively, 2% fluores-

* Contribution No. 46 from the Department of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

[1] Williams, John W., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 1173.

[2] Williams, John W., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 1174.

† Fluorescein, Schultz No. 585, Lot No. 6054. Eosin Y, Schultz No. 585, Batch E-7. Methyl Blue, Lot No. 3421. Janus Green, C. I. No. 133. Neutral Red, Lot No. 7272. Wright's Stain, NWr-7. All manufactured by National Aniline and Chemical Company, New York.

TABLE I.

Organism	F	M B & E	Wr.	N R	J G
Achorion schoenleinii	3 ++++ y	3 +++ r	8 ++	45 t. r.	—
Acladium castellani	3 +++— g	5 +++ b.p.	5 ++ cb	5 ++ p	8 ++ yr
Candida candida	3 +++ g	3 ++++ p—b	3 +++ s—b	3 ++ y—p	45
Endodermophyton tropicale	7 +++ g	18 ++ b	45 ++	10 ++ p	45 + b
Endomyces capsulatus	3 +++ g	10 +++ p		18 +	—
Endomyces dermatitidus	3 ++++ g	10 ++++ p	45 +	3 + r	45 ++ p
Epidermophyton cruris	3 +++ g	3 +++ p	10 ++	3 +	—
Epidermophyton inguinale	3 ++++ y	5 ++++ p—	3 +	3 +	—
Glenospora gammeli	3 +++ yg	3 +++ p	3 +++	45 ++	
Geotrichum bachmann	3 ++++ g	3 +++ b	3 ++++ b.s.	3 ++++ r	
Indiella americana	3 +++ g	5 +++	45	45 ++ r	
Lichthiemia sp.	3 ++++ yt	3 ++++	3 ++++	3 ++++	6 ++++
Microsporon audouini	8 +++ y	8 +++ p		8 +	
Microsporon felineum	3 +++ yt	3 +++ pt	5 ++	3 ++	8 ++ t
Microsporon gypseum	3 ++++ s—y	3 ++++ p	7 ++ cb—y	3 ++ p	45 + b
Monilia albicans	3 +++ g	3 +++ b	3 +++ cb—s	6 +++ r	
Monosporum apiospermum	7 ++++ g	3 +++ p	10 ++++	8 ++ r	45 ++ t
Oöspora humi	3 ++++ g	3 ++++ pv	3 ++++ b	3 ++++ r	
Scopulariopsis brevicaulis	3 ++++ gs	3 +++ vp	6 +++ c	8 +++ p	10 ++ s
Sporotrichum schenckii	3 +++ g	13 +++ b	3 ++ c—p—b	5 ++ r	
Trichophyton crateriforme	3 +++ y	3 +++ r		5 + p	
Trichophyton granulosum	3 ++++ y	3 ++++ p	3 +	7 +	
Trichophyton gypseum lacticolor	3 ++++ y—	3 ++++ r—	7 ++	7 ++ pt	
Trichophyton interdigitale	3 ++++ y—	3 ++++ p—	3 +++	3 ++	
Trichophyton niveum	3 ++++ yt	3 +++ r	3 +	3 ++	
Trichophyton sulfureum	7 +++ y	3 +++ —p—	18 ++ t	10 ++ pt	
Willia anomala	3 +++ y	10 ++ b		6 ++ r	6 ++ r

cein, 1% methyl blue and 1% eosin Y, ½% neutral red, ½% janus green, ½% Wright's stain suspension, were studied. The organisms were grown in diffused light at room temperature and observed over a period of 45 days.

The following pathogenic fungi and 2 non-pathogenic saprophytes, *Lichthiemia sp.* and *Scopulariopsis brevicaulis,* were observed: *Achorion schoenleinii, Acladium castellani, Candida candida, Endodermophyton tropicale, Endomyces capsulatus, Endomyces dermatitidus, Epidermophyton cruris, Epidermophyton inguinale, Glenospora gammeli, Geotricheum bachmann, Indiella americana, Microsporon audouini, Microsporon felineum, Microsporon gypseum, Monilia albicans, Monosporum apiospermum, Oöspora humi, Sporotrichum schenkii, Trichophyton crateriforme, Trichophyton granulosum, Trichophyton gypseum lacticolor, Trichophyton interdigitale, Trichophyton niveum, Trichophyton sulfureum, Willia anomala.*

Table I gives the time of appearance of growth and its relative amount. The following abbreviations are used: F, fluorescein; MB & E, methyl blue and eosin Y; Wr., Wright's stain suspension; NR neutral red; JG janus green; b, blue; br, brown; c, copper colored; g, golden; p, pink; r, red; s, salmon; sc, scarlet; t, tinted; v, varies; y, yellow; y— (letter followed by dash) indicates color centrally; —y— (dash letter dash) indicates color between center and border.

Reference to the chart will reveal that in the majority of cases growth is more profuse and more frequently colored when the acid dyes, methyl blue, eosin Y and fluorescein are used. With few exceptions, in keeping with the greater toxicity of basic dyes, growth occurs either not at all or to a lesser extent on media containing them. The strongly basic dye, janus green, shows this effect to the greatest degree, whilst Wright's stain suspension containing a low concentration of basic dye is less active and the weakly basic dye, neutral red, least.

The letters are used to designate color. Growths showing color on neutral red do not show the blue indicative of alkaline reaction. On Wright's 2 colors are noted in several colonies. On methyl blue and eosin Y, some growths show blue, some pink, some both. Selectivity of the latter dyes might be variable since both are strong acid dyes.

In practically all instances on acid dye media, growth and differentiation were as good as on the control. If acid dye media were selected for routine work much smaller concentrations of dye could be used. Such media are especially valuable for contrast.

Colonies which show color macroscopically also show it microscopically. The elements (*i. e.*, portions of the cells) of growth colored are similar to those colored in staining growths from ordinary media. Double staining was noted in a few instances in growths from methyl blue-eosin Y and Wright's stain suspension media. The microscopic picture of dye media growth was in several instances superior to that obtained when specimens were stained from growth on ordinary media. If dye could be prevented from diffusing out of dye media cultures without destroying structure it is probable that the microscopic picture would be much more desirable.

7793 C

Experimental Production of Bulbar Poliomyelitis.

JOHN A. TOOMEY.

From the Department of Pediatrics, Western Reserve University, and the Division of Contagious Diseases, City Hospital, Cleveland, Ohio.

Poliomyelitis has been experimentally produced in *Macacus rhesus* monkeys by injecting the virus into the ileum between clamps or subserosally in the same area.[1] Levaditi, Kling and Hornus[2] introduced the virus into the gastrointestinal tract of a *Macacus cyanomolgus* monkey and the animal later became ill with the disease. In the former instance,[1] the clinical picture was similar to that seen in the human being ill with spinal poliomyelitis. The animals developed palsy of muscle groups, monoplegia and paraplegia of the legs, but not the condition of quadriplegia that usually follows intrasciatic and intracerebral inoculations and intranasal instillations.

It has been shown that the virus spreads along the axis cylinders of the sympathetic thoracolumbar outflow.[3] It has also been pointed out that such a spread from the gastrointestinal tract directly to the cord by way of the afferent and efferent grey fibers has a simple and logical anatomical explanation.[4] It is an explanation that would also apply to typhoid fever, another gastrointestinal disease.[5] Al-

[1] Toomey, John A., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 680.

[2] Levaditi, C., Kling, C., and Hornus, G., *Compt. rend. Soc. de biol.*, 1933, **112**, 43; *A. J. Dis. Child.*, 1934, **48**, 423.

[3] Toomey, John A., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 502, 702.

[4] Toomey, John A., *Jaahrb. für Kinderheilkinde*, in press; *Am. Coll. Physicians*, April 18, 1934; *Annals Int. Med.*, in press.

[5] Toomey, John A., *A. J. Dis. Child.*, 1934, **48**, 1296.