3.55 g. (0.0116 mole) of the 4-methyl derivative in 15 ml. of N,N-dimethylformamide was treated with a methanolic solution of sodium methoxide (0.014 mole of $NaOCH_3$)[10] and then with 1.05 ml. (0.0168 mole) of methyl iodide as described under C. The mixture was worked up as described under C and yielded 2.7 g. (73%), of a compound identical in every respect with that obtained under F.

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Derivatives of 2-(2-Pyrimidinyl)acetophenone[1]

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Cyclic amidines and guanidines are well known classes of diuretic agents.[3] This paper reports the synthesis of some derivatives of 2-(2-pyrimidinyl)acetophenone (I),[4-6] a cyclic amidine, as potential diuretic agents. When the ketone I was reacted with an equimolar amount of phenylmagnesium bromide the phenylcarbinol was obtained in 31% yield, with recovery of 67% of I; phenyllithium gave similar results. If one assumes that part of the Grignard reagent complexes with the pyrimidine ring nitrogens, then excess reagent should increase the yield of carbinol. This was found to be true, as the yield increased to 61% and 81% for 2:1 and 3:1 *M* ratios, respectively, of Grignard reagent to ketone.

Catalytic hydrogenation of the methochloride of I produced a tetrahydro carbinol. The structure assignment was based on the formation of benzaldehyde (retroaldol) on treatment with dilute sodium hydroxide solution. Stopping the hydrogenation after 2 moles of hydrogen were added yielded a compound which did not yield benzaldehyde when reacted with base; therefore, the tetrahydro ketone structure was assigned to the product.

Experimental[7]

α,α-Diphenyl-2-pyrimidineethanol. A.—To 14.9 g. (0.082 mole) of phenylmagnesium bromide in 85 ml. of ether was added over 3 min., 5.4 g. (0.0273 mole) of the ketone I[5] in 225 ml. of benzene and 60 ml. of ether. The solution was heated at reflux for 30 min., cooled, acidified with 50 ml. of 10% sulfuric acid, and the solid filtered to give 7.9 g. (81%), m.p. 221–224° dec., of the **hydrobromide** salt, after two recrystallizations from nitromethane, m.p. 231° dec.

Anal. Calcd. for $C_{18}H_{16}N_2O \cdot HBr$: C, 60.51; H, 4.80; N, 7.84. Found: C, 60.11; H, 4.86; N, 7.80.

The **free base** melted at 141–143°.

Anal. Calcd. for $C_{18}H_{16}N_2O$: N, 10.14. Found: N, 10.07.

B.—To 1.71 g. (0.0204 mole) of phenyllithium in 50 ml. of ether was added over 10 min. 3.6 g. (0.0182 mole) of I in 150 ml. of benzene and 50 ml. of ether. The solution was diluted with 50 ml. of ether, stirred for 30 min., adjusted to pH 5 with 5% sulfuric acid, and the solid filtered. The yield of hydrobromide salt was 1.6 g. (25%), m.p 231–233° dec. From the aqueous and organic layers 56% of I was recovered.

2-(2-Hydroxy-2,2-diphenylethyl)-1-methylpyrimidinium Iodide.—A mixture of 2.0 g. (0.0073 mole) of α,α-diphenyl-2-pyrimidineethanol and 10 ml. of methyl iodide was allowed to stand in a closed flask for 1 week. Removal of excess methyl iodide by evaporation yielded 3.0 g. (99%), m.p. 235–240° dec., of yellow methiodide. One recrystallization from 30 ml. of water yielded 2.22 g. (73.3%), m.p. 239–240° dec.

Anal. Calcd. for $C_{19}H_{19}IN_2O$: I, 30.34. Found: I, 29.92.

1-Methyl-2-phenacylpyrimidinium Iodide.—A mixture of 5.1 g. (0.0257 mole) of the ketone I and 25 ml. of methyl iodide was heated in a sealed tube in a water bath at 60–80° for 5 hr. The yield of yellow solid after filtration was 8.0 g. (91.5%), m.p. 189–191°. After 2 recrystallizations from a mixture of ethyl acetate and ethanol the methiodide melted at 190.5–191°.

Anal. Calcd. for $C_{13}H_{13}IN_2O$: N, 8.24. Found: N, 8.24.

The methochloride was prepared by treating a suspension of silver chloride in water with an aqueous solution of the methiodide.

2-(1,4,5,6-Tetrahydro-1-methyl-2-pyrimidinyl)acetophenone Hydrochloride.—A solution of 1.5 g. (0.0064 mole) of the methochloride of I in 25 ml. of absolute ethanol was reduced over 70 mg. of platinum oxide catalyst in a low pressure hydrogenation apparatus. The hydrogenation was stopped after 2 *M* equiv. of hydrogen was added (10 min.). The catalyst was filtered and the filtrate evaporated *in vacuo* to give 1.44 g. (95%) of solid, m.p. 250–253°. This was recrystallized from 2-propanol and then butanol to give white crystals, m.p. 252–253°.

Anal. Calcd. for $C_{13}H_{16}N_2O \cdot HCl$: C, 61.77; H, 6.78; Cl, 14.03. Found: C, 60.90; H, 6.77; Cl, 13.83.

1,4,5,6-Tetrahydro-1-methyl-α-phenyl-2-pyrimidineethanol Hydrochloride.—A solution of 1.5 g. (0.00604 mole) of I-methochloride in 25 ml. of absolute ethanol was reduced over 70 mg. of platinum oxide catalyst in a low pressure hydrogenation apparatus. The reduction was stopped after 3.5 *M* equiv. of hydrogen was added (160 min.) and the catalyst filtered. The filtrate was evaporated in vacuo, and the residual gum (1.4 g.) when added to 2-propanol crystallized to give 0.5 g. (32.5%), m.p. 223–224°, of white solid. This was recrystallized to constant melting point (223–224°) from 2-propanol.

Anal. Calcd. for $C_{13}H_{18}N_2O \cdot HCl$: C, 61.29; H, 7.52; Cl, 13.92. Found: C, 61.44; H, 7.36; Cl, 13.84.

When the hydrochloride salt was treated with 10% sodium hydroxide solution an odor of benzaldehyde was produced, and when this solution was acidified and reacted with 2,4-dinitrophenylhydrazine, a hydrazone was obtained, m.p. 238–239° (no depression with benzaldehyde 2,4-dinitrophenylhydrazone, lit.[8] m.p. 237°).

(1) Taken in part from the thesis of F. F. Ebetino submitted in partial fulfillment of the requirements for the Master of Science degree at Lehigh University, 1953.

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Synthesis of Some Derivatives of 5-Aminoindole-3-acrylic Acid[1a]

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Recently we have reported on the preparation of the 5-nitrogen mustards of tryptophan[1b] and other indole-3-alkanoic acids.[1c] As a continuation of this series we have undertaken the preparation of the corresponding mustard (I) of indole-3-acrylic acid. A

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